JVC

SERVICE MANUAL

VHS VIDEO MOVIE SYSTEMS VHS C PAL

VHS VIDEO MOVIE

MODEL GR-45EG/EK

RF UNIT

MODEL RF-V3E

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No. 86025
November 1987

NOTE: For a technical description, please refer to Technical Guide VTG86005 GR-45 PAL.

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– OPTION –
RF-V3E

1. DIAGRAM AND CIRCUIT BOARD

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2. EXPLODED VIEWS AND PARTS LIST

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

ADVARSELI

LITHIUMBATTERIER. EKSPLOSIONSFARE.
UDKSIFTNING MÅ KUN FORETAGES AF SAGKYNDIG
OG SOM BESKREVET I SERVICEMANUALEN

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (░) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors

5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

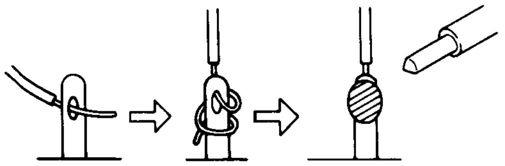


Fig. 1

6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

7. Check that replaced wires do not contact sharp edged or pointed parts.

8. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

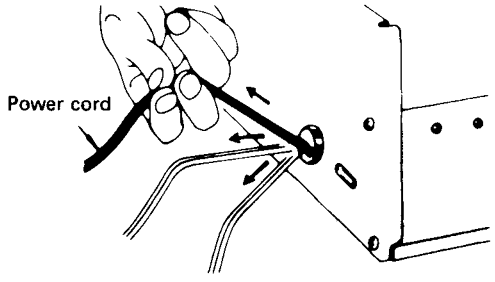


Fig. 2

9. Also check areas surrounding repaired locations.

10. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

11. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

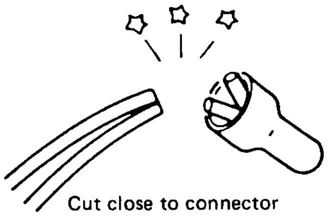


Fig. 3

       (2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

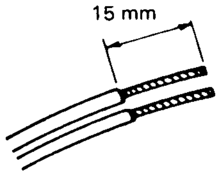


Fig. 4

       (3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

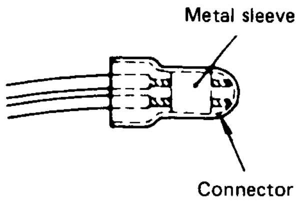


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

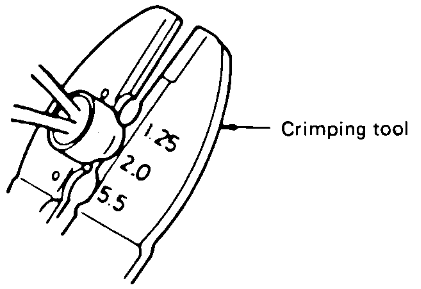


Fig. 6

(5) Check the four points noted in Fig. 7.

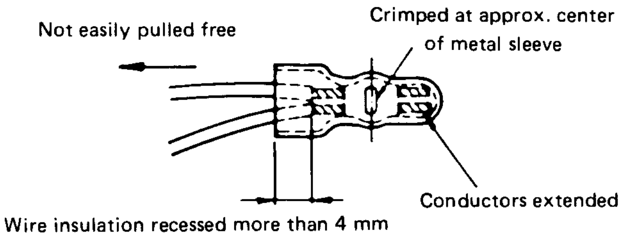

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table below.
2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table below.
3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table below.

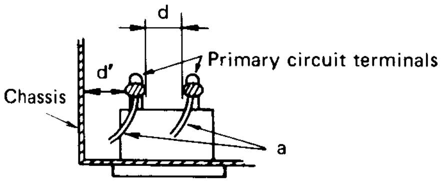


Fig. 8

4. **Leakage current test**
   Confirm specified or lower leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

   Measuring Method: (Power ON)
   Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure and following table.

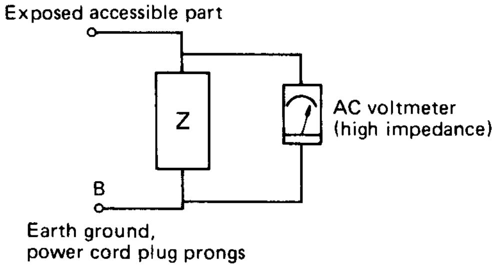


Fig. 9

AC Line Voltage	Region	Insulation Resistance	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	≧ 1 MΩ/500 V DC	1 kV 1 minute	≧ 3 mm
110 to 130 V	USA & Canada	–	900 V 1 minute	≧ 3.2 mm
*110 to 130 V 200 to 240 V	Europe Australia	≧ 10 MΩ/500 V DC	4 kV 1 minute	≧ 6 mm (d) ≧ 8 mm (d') (a: Power cord)

*Class II model only.

Table 1 Ratings for selected areas

AC Line Voltage	Region	Load Z	Leakage Current (i)	Earth Ground (b) to:
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current ratings for selected areas

Note: This table is unofficial and for reference only Be sure to confirm the precise values for your particular country and locality.

JVC

SERVICE MANUAL

VHS VIDEO MOVIE VHS C PAL

GR-45EG/EK

HQ
High Quality

JVC
VideoMovie
VHS C
FULL AUTO
FOCUS
W.BALANCE
SHUTTER
RESET
MEMORY
AF
HQ

SPECIFICATIONS

Format : VHS standard
Power source : DC 9.6 V ⎓
Power consumption : 8.5 W
Signal system : PAL
Recording system : Luminance: FM recording
Colour: Converted sub-carrier direct recording
Conforms to VHS standard
Cassette : VHS-C cassette
Tape speed (SP) : 23.39 mm/sec
(LP) : 11.70 mm/sec
Recording time
Max. (SP) : 30 minutes (with EC-30 cassette)
(LP) : 60 minutes (with EC-30 cassette)

VIDEO
Output : 1 Vp-p, 75 ohms, unbalanced (via AV OUT connector)
S/N ratio : More than 43 dB (with Rohde & Schwarz noise meter)

AUDIO
Output : –6 dBs, 1 k-ohm (via AV OUT connector)
Microphone input : –68 dBs, high impedance, unbalanced
Pickup : 1/2''-format CCD
Minimum required illumination : 10 lux (at F/1.4)
Illumination range : 10 – 100,000 lux
Lens : F/1.4 ~ 2.0, f = 9 – 54 mm, 6:1 two-speed power zoom lens with auto iris control and macro position, filter diameter 49 mm
Viewfinder : Electronic viewfinder with 0.6'' black/which CRT
Selectable high-speed shutter : 1/250, 1/500, 1/1000 second
Colour temperature switching : Switchable (3,200 K/4,500 K/5,500 K)
White balance adjustment : Full-auto/preset standard
Operating temperature : 0° C to +40° C
Operating humidity : 35% to 80%
Storage temperature : –20° C to +50° C

Weight : 1.2 kg (with viewfinder)
Dimensions : 110(W) x 149(H) x 243(D) mm (incl. viewfinder)

AA-V5EG SPECIFICATIONS
Power requirement : AC 110 – 240 V~, 50/60 Hz
Power consumption : 21 watts
Output : DC 14 V ⎓ 1.1 A (Charge)
DC 9.6 V ⎓ 1.2 A (VideoMovie)
Charging system : Constant current, peak detection, timer controlled
Dimensions : 68(W) x 38(H) x 150(D) mm
Weight : Approx. 340 g

C-P5U SPECIFICATIONS
Type : VHS cassette adapter
Dimensions : 188(W) x 25(H) x 104(D) mm
Weight : 235 g
Accessory : "R6"-size battery x 1

RF-V3E SPECIFICATIONS
Output channel : UHF channel 32 – 40 (adjustable)
Initial channel setting : UHF 36
Power source : DC 8 V ⎓ 20 mA (from VideoMovie)
Dimensions : 52(W) x 80(H) x 24(D) mm excl. cable
Cable length : 2.5 m
Weight : Approx. 160 g

Provided accessories:

AC power adapter/battery charger	AA-V5EG/EK
Cassette adapter	C-P5U
Cassette tape	EC-30
Battery pack	BN-V6GU
RF unit	RF-V3E
Shoulder strap	
Electric viewfinder	
Lens cap	
Lens hood	
Battery for clock operation	

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

No.86025 (1/2)
November 1987

INSTRUCTIONS

MANUEL D'INSTRUCTIONS/BEDIENUNGSANLEITUNG/
MANUAL DE INSTRUCCIONES/GEBRUIKSAANWIJZING/BRUKSANVISNING

VideoMovie

VHS C PAL

HQ High Quality

CAMERA-RECORDER/PLAYER

GR-45E

Specifically for the GR-45E/AA-V5EG

JVC
VideoMovie
VHS C
FULL AUTO
FOCUS: AUTO
W.BAL: AUTO
SHUTTER: 1000
45
FOCUS
W.BALANCE
SHUTTER
RESET
MEMORY
AF AUTO FOCUS
HQ High Quality

CCD
Charge Coupled Device

AF
AUTO FOCUS

JVC

CAMERA-ENREGISTREUR/LECTEUR GR-45E
Spécial pour le GR-45E/AA-V5EG

KAMERA-REKORDER GR-45E
Für Modellausführung GR-45E/AA-V5EG

CAMERA/GRABADORA GR-45E
Especialmente para la GR-45E/AA-V5E

KAMERA/RECORDER GR-45E
Speciaal voor de GR-45E/AA-V5EG

KAMERA/BANDSPELARE
Speciellt avsedd för GR-45E/AA-V5EG

YU30052-17

SAFETY PRECAUTIONS

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

This equipment should be used with DC 9.6 V ⎓ only.

CAUTION:
To prevent electric shocks and fire hazards, do NOT use any other power source.

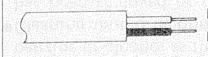
The AA-V5EG AC Power Adapter/Battery Charger should be used with 110 – 240 V∿, 50/60 Hz only.

Caution:
To prevent electric shocks and fire hazards, do NOT use any other power source.

IMPORTANT (In the United Kingdom)
Mains Supply (240 V∿, 50 Hz only)

IMPORTANT

Do not make any connection to the Larger Terminal coded E or Green. The wires in the mains lead are coloured in accordance with following code:

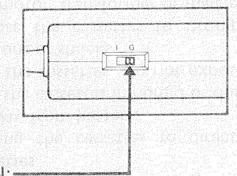


If these colours do not correspond with the terminal identifications of your plug, connect as follows:
Blue wire to terminal coded N (Neutral) or coloured Black.
Brown wire to terminal coded L (Live) or coloured Red.
If in doubt – consult a competent electrician.

Note
We recommend that you should disconnect the AC cord from the outlet.

- VideoMovie is designed exclusively for the VHS C video cassette. Only cassettes marked VHS C can be used with this unit.
- HQ VHS is compatible with existing VHS equipment.

Warning on lithium battery
The battery used in this device may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble, heat above 100°C or incinerate.
Repalce battery with Matsushita Electric, CR 2025; use of another battery may present a risk of fire or explosion.
- Dispose of used battery prompty.
- Keep away from children.
- Do not disassemble and do not dispose of in fire.



ATTENTION:
The system select switch on the side of the provided RF unit RF-V3E has been set to G (Continental PAL, 5.5 MHz).

CAUTION:
To prevent shock, do not open the cabinet. No user serviceable parts inside. Refer servicing to qualified personnel.

NOTES:
- The rating plate (serial number plate) and safety caution of the main unit are on its bottom.
- The rating plate (serial number plate) of the viewfinder is on its bottom.
- The rating plate (serial number plate) of the AC power adapter/battery charger is on its bottom.

The provided viewfinder is the VF-V45E. Do not use any other viewfinder with the GR-45E.

This equipment has been produced to comply with Directive number 82/499/EEC.

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PRECAUTIONS

For safety, strictly observe the following instructions.

- Do not open the cabinet.
- Prevent inflammables, water and metallic objects from entering the unit.
- Do not use the unit when there is lightning in the vicinity. Disconnect the power cable of connected equipment.

Avoid using the unit under the following conditions:

- Places subject to excessive humidity or dust.
- Near appliances generating strong magnetic or electric fields (speakers, broadcasting antennas, etc.).
- Places subject to soot or steam such as near a cooking stove.
- Places subject to excessive shock or vibration.
- Near a television set (rolling pictures or howling might result).
- Extremely hot places.

Do not expose the unit to high temperatures over 50°C for long periods.

If the unit should be subjected to direct sunlight, or left in a closed car in summer, or placed near a heater, the CCD and the auto-focus sensor may deteriorate and the cabinet may become deformed. Furthermore, this also may cause the transistors and other electronic and mechanical parts to malfunction. Remember the following:

- Do not leave the unit in places of over 50°C.
- Do not use the unit in places of over 40°C.
- Do not use the unit in places of below 0°C.
- Protect the unit from excessively dry or excessively humid conditions (below 35 % or above 80 % humidity)
- For long storage, select a place between -10°C and 30°C.

Take special care for protection of the unit.

- Do not allow the unit to become wet.
- Do not leave the unit in closed cars on hot summer days.
- Take special care not to drop the unit or strike it against hard objects. Protect from shocks during transportation.

Make it a rule to observe the following instructions.

- Do not remove the battery pack or disconnect other power supply units during recording or playback before pressing the POWER switch to OFF. If not observed, this will cause tape damage.
- When the unit is not in use, remove the battery pack.

Keep the lens and viewfinder eyepiece always clean.

- When the lens is dirty or dusty, blow it off first and then gently wipe with a soft brush or lens cleaning paper.
- The lens is likely to become moldy if left dirty.

Be careful not to damage the CCD and auto-focus sensor.

- Do not keep the lens directed at extremely bright objects such as the sun or other light sources for long periods. Although the CCD is less susceptible to such burn than a tube would be, caution should be exercised when using this unit. Most importantly, the lens should be capped except while actually shooting.
- Do not direct the eyepiece of the viewfinder at the sun.

Auto-focus requries a bit of consideration.

- Do not touch the focus ring while the auto-focus mechanism is in operation as this could damage the auto-focus mechanism.
- When a filter or a special-effect lens is to be attached to the end of the lens, be sure to turn power off or switch from the Auto-focus mode to the Manual mode. NEVER attempt to attach a filter or lens while the auto-focus mechanism is operating as this will result in malfunctioning. (If a teleconversion or wide-angle conversion lens is attached, the auto-focus mode cannot be used.)

Handle the unit carefully.

- Protect the microphone from excessive shocks.
- Do not carry the unit by holding it only by the viewfinder.

Moisture condensation disenables use of the unit.

- You have observed that pouring a cold liquid into a glass will cause drops of water to form on the glass's outer surface. This same phenomenon occurs on the head drum of a video recorder when the recorder is moved from a cool place to a warm place, after heating a cold room, under extremely humid conditions or in a place directly subjected to the cool air from an air conditioner.
- Moisture on the head drum can cause severe damage to the video tape, and can lead to internal damage to the recorder itself.
- If moisture condensation occurs on the head drum, a condensation warning appears in the counter display and the unit enters the Stop mode, unable to function. In such a case, wait for a few hours until the indicator disappears.

Maintenance

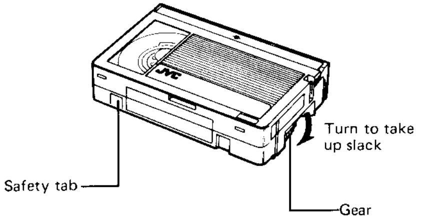
- When the cabinet is dusty, clean by gently wiping with a soft cloth.
- Avoid the use of strong cleaning agents such as benzine or alcohol as they may damage the cabinet.
- Cleaning should be done only after the battery pack has been removed or other power units have been disconnected.

Serious malfunctioning

> If malfunctioning occurs, stop using the unit immediately and consult your local JVC dealer.

VIDEO CASSETTES

- The GR-45E employs only compact video cassettes carrying the VHS C mark.
- Recording onto prerecorded tapes automatically erases the previously recorded video and audio signals.
- An inverted cassette cannot be inserted.
- Do not load and unload the cassette repeatedly without allowing the tape to run at all. This will slacken the tape and thereby damage it.
- Make certain before loading the cassette that the tape is not slackened. If there is any slack, turn the gear on the cassette in the direction of the arrow to take up slack.
- The cassette is equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording is impossible. If you wish to record on a cassette whose tab has been removed, use adhesive tape to reseal the slot.
- To avoid excessive exposure to dust and fingerprints, do not open the front tape cover.



Storage of cassettes

- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid storing the cassettes in humid or dusty palces.
- Do not drop the cassettes. Do not expose them to violent vibrations or shocks.
- Do not expose the cassettes to strong magnetic fields (near a motor, transformer or magnet).
- Place the cassettes in cassette cases and position them vertically.

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- High-speed shutter 19

Connection to a television for playback 19

Tape dubbing or editing

- Dubbing onto a standard recorder 20
- Using the Master Edit Control System 21
- Setting the edit-out point using counter memory 21

Using the GR-45E as a video camera 22
Charging the battery pack 23
Using the cassette adapter (provided) 24
Systems flexibility 25
Shoe adapter (optional)/carrying handle (optional) 27
Remote control unit (optional) 27
Tripod mounting 27
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In case of difficulty 29
Specifications 30

FEATURES

- Allows direct playback with no additional components necessary.
- Ultra-compact and ultra-lightweight: a mere 1.2 kg.
- Multi-speed electronic shutter for sharp, clear playback of fast-action shots: 1/50, 1/250, 1/500 and 1/1000.
- Newly developed high-resolution 1/2" field-storage type CCD (Charge Coupled Device) pickup delivering 400-line resolution pictures.
- One-button full-auto operation of focus, exposure, and white balance.
- Powerful, two-speed 6:1 power zoom with macro function.
- HQ (High Quality) System for superlative picture quality.
- Maximum of 60 minutes recording time on a single tape in LP mode
- Double-Azimuth 8-head system for quality recording and playback in both the SP and LP modes.
- High-sensitivity/low-lag design: allows shooting in light as low as 10 lux.
- Image Sensing auto-focus.
- Automatic Colour Tracking white balance with three preset positions.
- Backlight compensation button.
- Audio/video fader linked to start/stop trigger.
- Large, easy-to-read LCD display.
- Ultra-compact adjustable electronic viewfinder (monochrome CRT, 0.6-inch screen) with diopter control, also for instant on-the-spot playback.
- Selectable automatic date recording function.
- Recordable date/time display.
- Elapsed recording time counter.
- Second recording start/stop button provided on top of GR-45E.
- Zero Frame Editing for noise-free, smooth scene transitions.
- Dubbing mode switch provided for best results when dubbing.
- Selectable quick review function.
- One-button recording standby mechanism.
- Master Edit Control system: allows control of both GR-45E and connected designated VCR using GR-45E's controls, and preroll editing for edits free of transition-point gaps and noise.
- Shuttle Search in both directions.
- Unique grip battery doubles as palm grip, saving weight and space.
- Ergonomic design with palm grip and finger rest for trigger control.
- Trigger alarm informing the operator with electronic sound when the start/stop trigger is operated.
- Three-way power supply flexibility: battery pack, AC power adapter, and car battery.

POWER SUPPLY SYSTEM

The convenient 3-way power supply system gives you a choice of the most appropriate power supply unit, depending on the application.

CAUTION
- No function is available without power supply.
- Do not use any power supply other than specified.
- Never attempt to use these power supply units with any equipment other than the VideoMovie.

Where AC power is not available

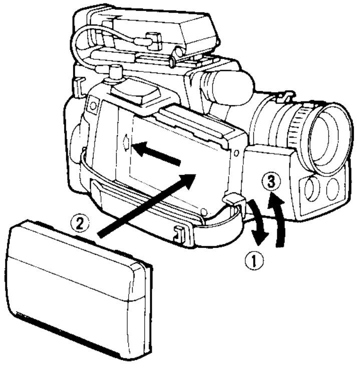
Use the battery packs:
- BN-V5GU (Regular)
- BN-V6GU (High-capacity)

Note:
The battery pack has been kept in the uncharged state for shipment. Therefore, before use, be sure to charge it. See page 23.

Attaching the Battery Pack

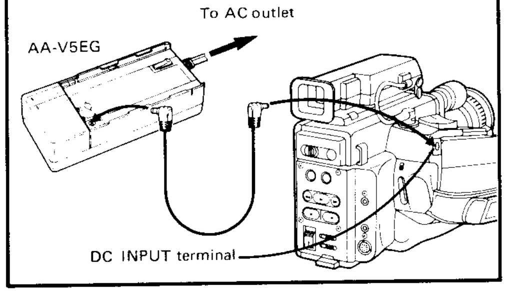
① Pull down the battery pack release lever.
② Align the battery pack over the outline in the battery pack mount, and slide the battery pack into place in the direction of the arrow.
③ Push up on the battery pack release lever, until it locks into place.

To remove the battery pack, pull down the battery pack release lever and slide out the battery.



With AC power

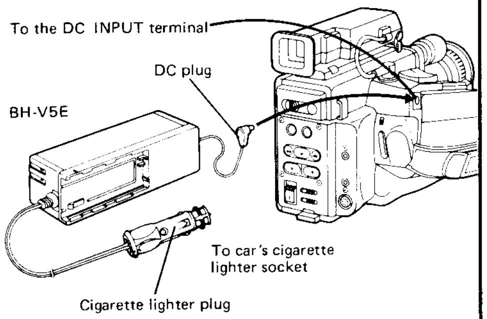
Use the provided AA-V5EG AC power adapter/battery charger.

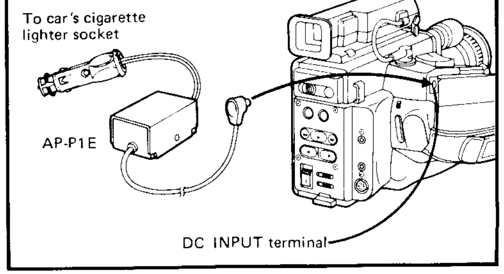


In a car

Use the optional AP-P1E car battery cord or BH-V5E car battery charger.

- Leave the car's engine idling when using the car battery. (For use with 12-V negative-grounded cars only.)

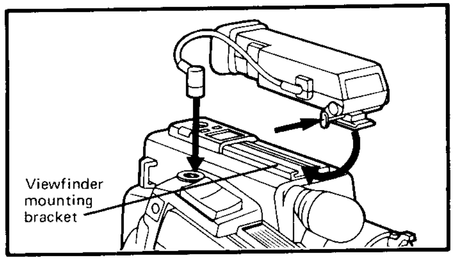




BASIC PREPARATIONS

Switch off power before mounting or removing viewfinder.

Mounting the viewfinder

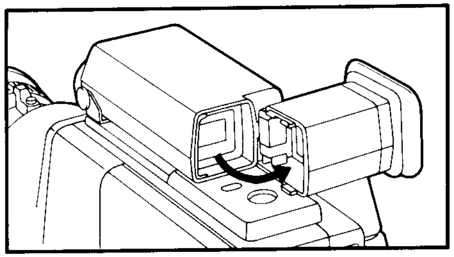

Viewfinder
mounting
bracket

1 Align the viewfinder's coupling fixture with the mounting bracket on the body and slide the fixture into the bracket while pressing the knob.

2 Connect the viewfinder cable to the viewfinder cable connector (EVF).

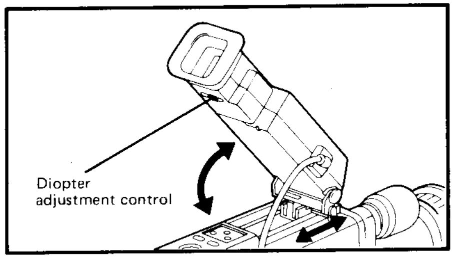
To remove the viewfinder:
Pull out the viewfinder cable and slide the viewfinder out of the bracket while pressing the knob.

Opening the eyepiece



The viewfinder eyepiece can be opened for cleaning or better viewability in playback.

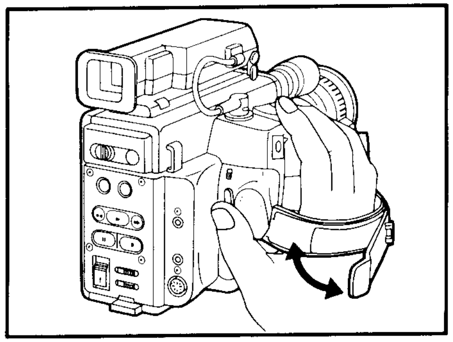
Viewfinder adjustment


Diopter
adjustment control

The viewfinder lens can be adjusted to suit the operator's eyesight by sliding the diopter adjustment control. Its normal position is to the far left, toward the cassette compartment.

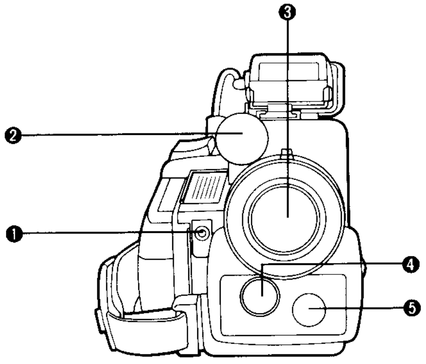
The viewfinder can be positioned for best viewability. It can slide forward or back and can be tilted up 90°.

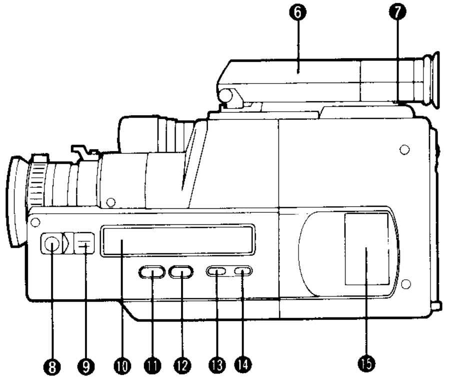
Adjusting the Grip Strap



1 Separate the Velcro strip to expand the loop.

2 Pass your right hand through the loop and grasp the lens grip. Adjust the length of the strap to suit your hand size and refasten the Velcro strip.

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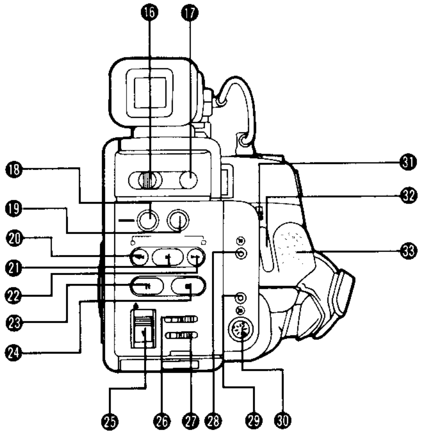
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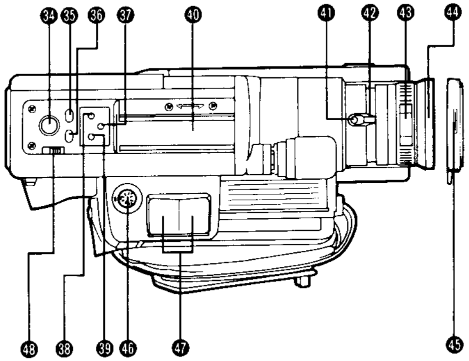
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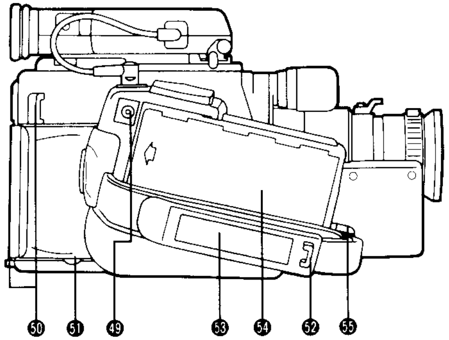
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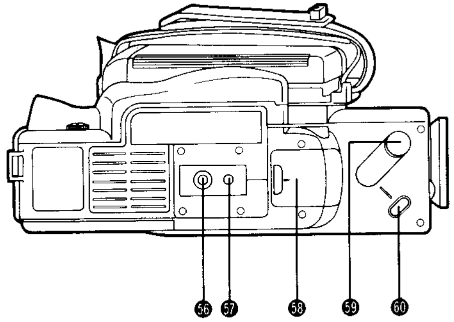
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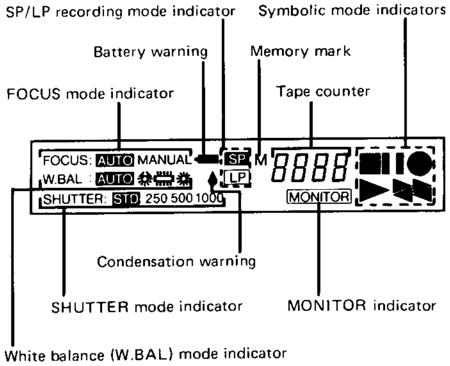
CONTROLS AND CONNECTORS

Refer to the diagrams on the front foldout page.

① **External microphone jack (MIC) (Page 27)**
② ***Exclusive microphone***
③ **6:1 zoom lens**
④ **Auto-focus sensor window**
Allows light to enter for measuring the camera-to subject distance.
⑤ **White balance sensor window**
Allows light to enter for white balance adjustment.
⑥ **Electronic viewfinder**
For monitoring scene being shot or the playback picture after recording.
⑦ **Dioptric adjustment knob (Page 6)**
⑧ **FULL AUTO button**
Pressing this button puts the focus and white balance under automatic control and selects the standard shutter speed.
⑨ **FOCUS select button**
Switch to AUTO for automatic focus, and switch to MANUAL to focus manually.
⑩ **LCD display**



Symbolic mode indicator

STOP:	■	REWIND:	◀◀
PLAY:	▶	FAST FORWARD	▶▶
PAUSE: (STILL)	❚❚	REVERSE SHUTTLE SEARCH:	▶ ◀◀
RECORD:	●	FORWARD SHUTTLE SEARCH:	▶ ▶▶
RECORD PAUSE:	❚❚●	MASTER EDIT CONTROL:	▶ Blinking
QUICK REVIEW	❚❚● Blinking	TAPE END WARNING	● Blinking

⑪ **W.BALANCE select button (Page 9)**
The white balance is manually selectable using this button.
✲ : Halogen or tungsten lighting.
▦ : Fluorescent lighting.
✹ : Daylight.
⑫ **SHUTTER select button (Page 19)**
⑬ **Counter RESET button (Page 14)**
⑭ **Counter MEMORY button (Page 14)**
⑮ **Cassette holder**
Insert a VHS-C video cassette for recording or playback.
⑯ **POWER switch (Page 9)**
Slide to turn the power on. The Stop indicator appears on the LCD display. Slide again to switch off power.
⑰ **REC standby button**
Press to engage the Recording standby mode. To start recording, press the recording start/stop button ㉜ .
⑱ **MONITOR button (Page 11)**
⑲ **QUICK REVIEW/EDIT button (Page 10)**
⑳ **REW/SHUTTLE SEARCH button**
Pressing this button in the Stop mode rewinds the tape; pressing it in the Play mode allows fast playback in reverse.
㉑ **PLAY button**
Press to start playback.
㉒ **FF/SHUTTLE SEARCH button**
Pressing this button in the Stop mode fast-forwards the tape; pressing it in the Play mode allows fast playback.
㉓ **PAUSE/STILL button**
Press to view a still picture during playback or pause playback.
㉔ **STOP button**
Press to engage the Stop mode.
㉕ **EJECT switch**
To open the cassette holder.
㉖ **SP/LP recording mode select switch**
Set to SP to record at standard tape speed. Set to LP to record at a slower tape speed, allowing an extended recording time of up to one hour with a single cassette.
㉗ **DUBBING ON/OFF switch**
Normally, set to OFF. For best picture quality when dubbing, set it to the ON position.
㉘ **REMOTE control jack**
For connection of the optional RM-P1U pause remote control unit.
㉙ **Earphone jack (PHONE)**
㉚ **AV OUT connector**
Both audio and video signals may be delivered from this connector.

㉛ **ALARM ON/OFF switch**
Switch to ON to engage the trigger alarm system. Switch to OFF when you do not wish to use this system. When the ALARM ON/OFF switch is set to ON, an electronic alarm beeps when the Recording start/stop button is pressed to begin recording. The electronic alarm beeps twice when the Recording start/stop button is pressed for record pause. This alarm helps prevent recording errors.
㉜ **Recording start/stop button**
Press this button in the Recording Standby mode to start recording. Pressing it again re-engages the Recording Standby mode.
㉝ **Finger rest**
Place your thumb on this grooved area next to the start/stop switch between switch operations.
㉞ **Second recording start/stop (SUB TRIGGER) button**
㉟ **DATE/TIME REC ON/OFF button**
Press this button when you do not wish to record the date/time. This will remove date/time indications from the viewfinder. Press again to record date/time. Date/time will reappear in the viewfinder.
㊱ **REC TIME RESET button**
Press this button to reset the elapsed recording time to zero.
㊲ **DISPLAY SELECT button**
Press this button to select the date/time display and recording mode. It cycles through the modes in the following order:

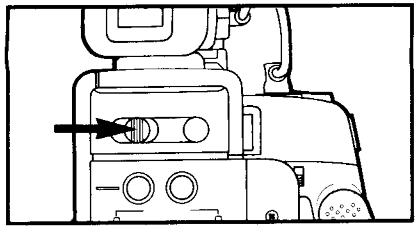
→ **Auto date record reserve** → **Date display** → **Date/time display** → **Time display** ↩

The auto-date-record function automatically displays and records the date for 5 seconds upon turning on the power and beginning recording. Before recording begins, this mode is indicated in the viewfinder by auto date record reserve indication "–.–.–".
㊳ **DATE/TIME SELECT button (Page 16)**
Use to select the portion of the clock or date settings to be changed. Cycles through the year, month, day, hour, and minute settings. To end adjustment, press once after selecting the minute portion.
㊴ **DATE/TIME SET button (Page 16)**
Use to set the built-in clock and date function.

㊵ **Viewfinder mount (Page 6)**
Attach the provided viewfinder.
㊶ **Macro button**
Turn the zoom ring while pressing this button for macro shooting.
㊷ **Manual zoom lever**
㊸ **Manual focus ring**
㊹ **Lens hood**
㊺ **Lens cap**
Cap the lens when not in use.
㊻ **Viewfinder cable connector**
Connect the viewfinder cable.
㊼ **Power zoom buttons**
㊽ **REC TIME ON/OFF switch**
When this switch is set to ON, the viewfinder displays the elapsed recording time. Switch to OFF to cancel the display. Unloading the cassette resets the display to "00.00". Note that this convenience functions only when camera shooting is performed.
㊾ **DC IN terminal**
For connection of the provided AC power adapter/battery charger, optional car battery charger or car battery cord for DC power supply. (Page 5)
㊿ **Slots for shoulder strap**
(51) **TRACKING control (Page 13)**
Minimizes noise bars, if observed, during playback.
(52) **Lens cap hook**
This keeps the lens cap from swinging during shooting.
(53) **Grip strap (Page 6)**
(54) **Grip-type battery mount (Page 23)**
(55) **Battery pack release lever (Page 5)**
(56) **Tripod mounting socket (Page 27)**
(57) **Stud hole**
(58) **CLOCK BATTERY compartment (Page 16)**
Holds the lithium battery that powers the date and time function.
(59) **BLC button (Page 19)**
Iris control is always automatic. For backlight compensation, press this button. While it is being pressed, the iris is 1 – 2 f-stops wider than the automatic setting.
(60) **FADER button (Page 15)**
To fade out the picture to black blank screen, press this button, then press the recording start/stop button to start fading out. To fade in from a black blank screen, press this button, then press the recording start/stop button to start fading in.

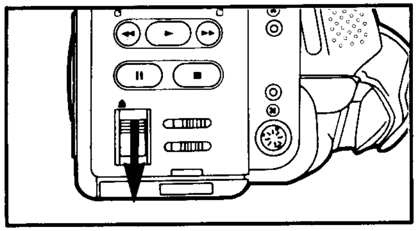
RECORDING OPERATION

1



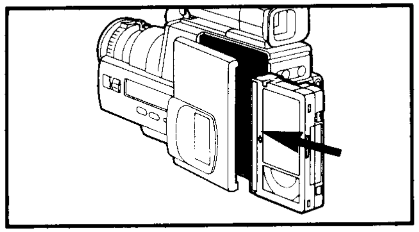
Slide the POWER switch to turn power on.

2



Open the cassette holder by pressing the EJECT switch.

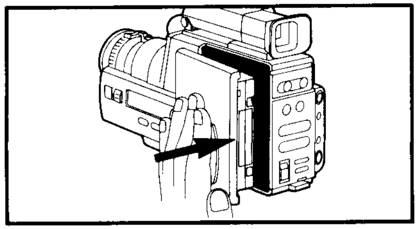
3



Insert the cassette with its printed arrow facing outward.

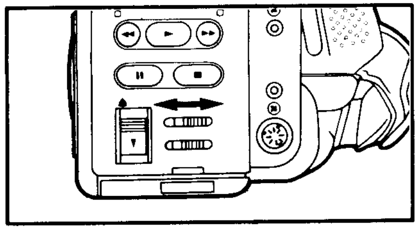
> First remove tape slack, then insert the cassette correctly. See page 3.

4



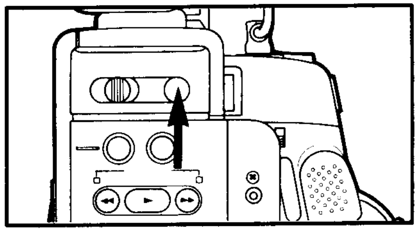
Close the cassette holder by pushing its center area.

5



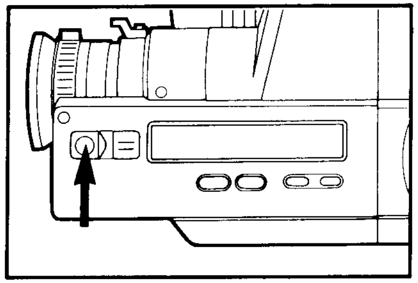
Set the tape speed to SP or LP.
SP: 30 minutes
LP: 60 minutes

6



Press the REC Standby button. The unit enters the Recording Standby mode.

7

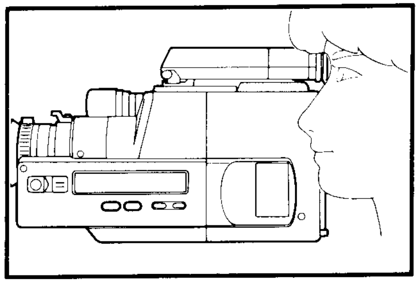


For full-auto operation, press the FULL AUTO button.

For manual override, use the W. BALANCE and FOCUS buttons.

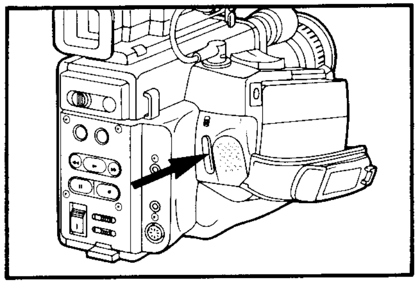
- Press the W. BALANCE button so that the required symbol appears on the viewfinder and on the LCD display.
  - 💡 : when the subject is illuminated by a halogen or tungsten lamp.
  - ▭ : when the subject is illuminated by a fluoresent lamp.
  - ☼ : when you shoot in the daytime outdoors.
- For manual focus, press the FOCUS button so that MANUAL is shown on the LCD display. A focus-aid indicator will appear in the viewfinder.

8



Determine the focus and composition by referring to the viewfinder image. For zooming, see page 18.
For date/time recording, see page 16.

9



Press the start/stop button.

- This causes REC or LP REC to appear on the viewfinder screen, showing that recording is actually taking place.

10 To stop recording temporarily, press the start/stop button once again.

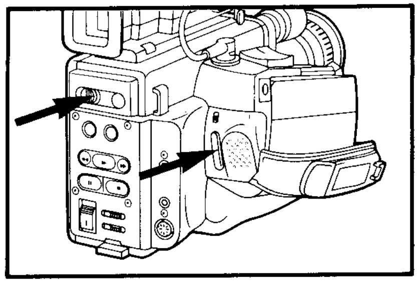
Quick Review function

- If you want to review the end of the last recording for confirmation, press the QUICK REVIEW/EDIT button from the Recording Standby mode; the tape will be rewound for about 2 seconds for program time and played back automatically for this section, after which it will stop in the Recording Standby mode for the next shot.

Notes:

- The TRACKING control should be at its center position.
- Distortion might occur when playback starts. This is normal.

11



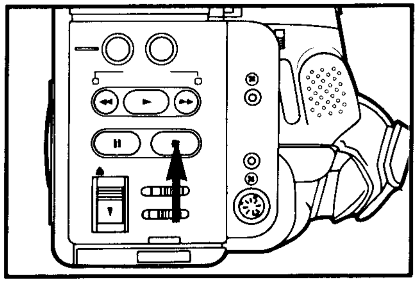
To restart recording, press the start/stop button.

- For a long pause, press the POWER switch to OFF to save battery power.
- If the Recording Standby mode continues for longer than about 5 minutes, the unit switches itself off automatically. To restart recording, turn the power on and press the start/stop button. This makes clean assembled recordings possible even after a long pause.

Assemble recordings

- Repeating steps 9 and 11 produces assemble recordings.
- If recording is restarted from the Stop mode, a few frames of the previously recorded picture is replaced with a new recording. To avoid this, follow the technique described in "Assemble Recording Technique-2" on page 12.

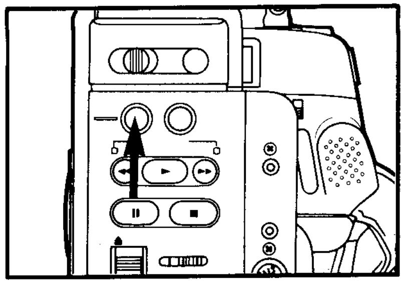
12



To end recording, press the STOP button.

- After making sure that the tape has stopped, press the POWER switch to OFF.

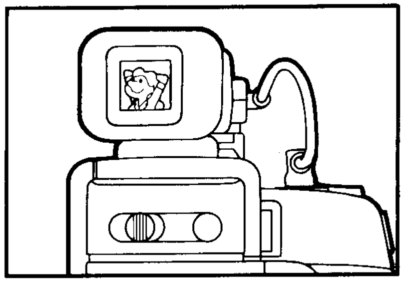
Rehearsal



If you wish to rehearse shooting angles, compose scenes, etc., without actually recording on the tape, press the MONITOR button, instead of REC. The aimed-at scene will appear on the viewfinder screen. For full-auto rehearsal, also press the FULL AUTO button. To engage the Recording Standby mode from rehearsal, press the REC button. To disengage the Rehearsal mode, press the STOP button.

- Rehearsal is possible whether a cassette is loaded or not.
- With a cassette loaded, rehearsal is not possible during rewind or fast forward.
- The power save circuit does not function during rehearsal. (For power save function, see page 12.)

Viewfinder Monitoring

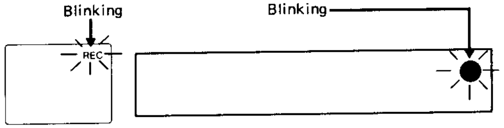


- Rewind the tape to a point from which you want to check the recording.
- Press the PLAY button, and you can view the playback picture on the viewfinder screen.

Notes:
- Pressing the PAUSE/STILL button during playback stops the picture on the viewfinder screen.
- Shuttle search is also possible in both directions.

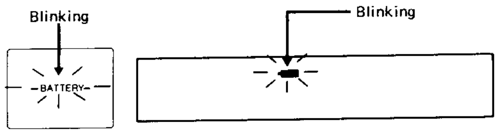
Warnings

Tape-end warning



- The recording indicator blinks on the viewfinder screen and the LCD display a few minutes before the end of the tape.
- When the end of the tape is reached during recording, the Stop mode engages automatically.

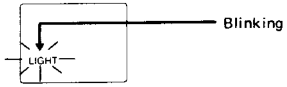
Battery warning



Viewfinder LCD Display

- When the battery power is coming to an end, a battery warning indication appears both in the viewfinder and the LCD display. Replace the battery pack with a fully charged one.
- After these indications appear, the power turns off automatically. In this state, however pressing the POWER switch while holding EJECT switch pressed turns the power on and ejects the cassette.

Low-light warning



- If the blinking "LIGHT" indicator appears on the viewfinder screen, the amount of light is insufficient. Increase the lighting.

POWER SAVE AND TAPE PROTECTION CIRCUIT

- To save battery power, the VideoMovie (when battery-operated) switches itself off automatically in the following situations:
  (1) When left for longer than 5 minutes in the Stop mode.
  (2) When left for longer than 5 minutes in the Recording Standby (Record-Pause) mode.
- To protect the tape, the VideoMovie (regardless of whether battery-operated or AC-powered) releases tape tension slightly and switches itself off automatically if left for longer than 5 minutes in the Recording Standby (Record-Pause) mode.
- For the same reason, the VideoMovie enters the Stop mode and switches itself off automatically if left for longer than 5 minutes in the Still (Play-Pause) mode.

Battery operation

STOP → POWER OFF
5 minutes

Battery/AC operation

REC PAUSE → POWER OFF
5 minutes

PLAY PAUSE (STILL) → STOP → POWER OFF
5 minutes

ASSEMBLE RECORDING TECHNIQUE — 1 (To replace the battery pack during recording)

1 If the battery warning appears in the viewfinder or the LCD display while recording, stop recording by pressing the POWER switch to OFF, not the STOP button.

2 Replace the battery pack with a charged one.

3 Press the POWER switch to ON.
- The unit will be in the Recording Standby mode.

4 Press the recording start/stop button to start recording.

ASSEMBLE RECORDING TECHNIQUE — 2 (To record onto a partially recorded tape)

1 Play back the tape to a point where you wish a new recording to start.
- Use the SHUTTLE SEARCH button for faster location.

2 Press the PAUSE/STILL button at the located point.
- The unit will enter the Still mode.

3 Press the REC button.
- The unit will enter the Recording Standby mode.

4 Press the recording start/stop button to start recording.

Note:
Some picture distortion may occur at the transition point. This is not due to any defect of the unit.

PLAYBACK

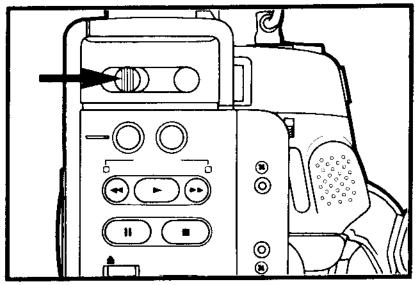
The GR-45E permits playback of recorded VHS-C video cassettes.
For connections refer to pages 19 and 20.

Preparation

- Set the aerial select switch of the RF-V3E RF unit to VIDEO and the TV receiver's channel selector to your video channel (specified AV channel).

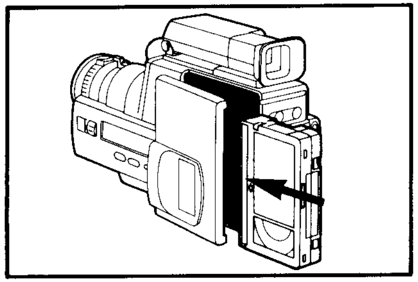
Connect a power supply unit. (Battery or AC operation: see page 5.)

1



Slide the POWER switch to ON.

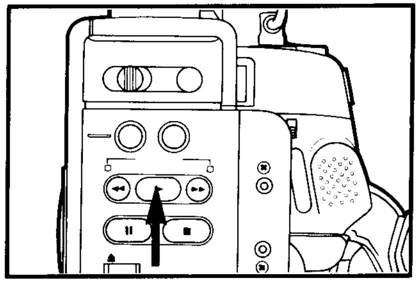
2



Insert a pre-recorded cassette.

First remove tape slack, then insert the cassette correctly. See page 3.

3

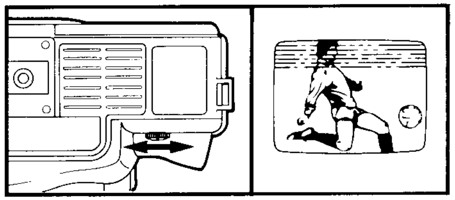


Press the PLAY button. Playback will start.

- The SP/LP switch may be in either position. The SP or LP mode recording is automatically detected and played back at a correct speed respectively.
- When the end of the tape is reached during playback, the Rewind mode engages automatically.

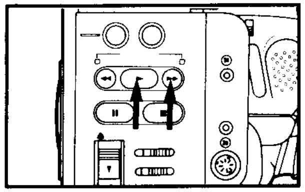
Tracking adjustment

If noise bars appear on the screen, adjust the TRACKING control. Turn it slowly in either direction to minimize noise bars. After playing a particular tape, return the TRACKING control to the center position.



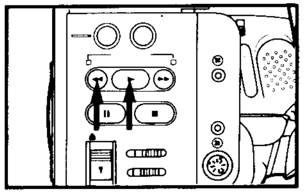
Shuttle Search

Fast-speed playback in the forward direction



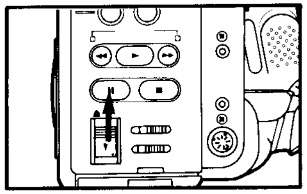
Press the FF button in the Play mode. Playback will be speeded up to 3 times normal speed in SP mode, 7 times normal speed in LP mode, as long as the button is being pressed.

Fast-speed reverse playback



Press the REW button in the play mode. The tape will be played back in the reverse direction at 3 times normal speed in SP mode, 7 times normal speed in LP mode, as long as the button is being pressed.

Still playback



Press the PAUSE/STILL button during playback. The picture will stop on the screen.

- After about 5 minutes of still playback, the unit enters the Stop mode automatically for tape protection and switches itself off.

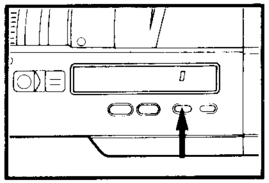
Note:

- Noise may appear on the screen during Shuttle Search and still playback. This is not due to any defect of the unit.

Counter Memory Function

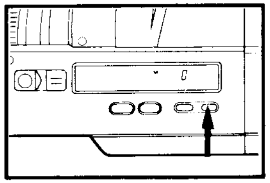
The GR-45E incorporates a counter memory mechanism which facilitates locating a specific tape segment.

1



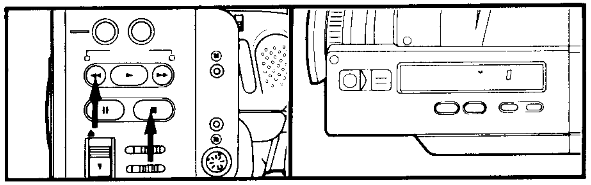
Press the RESET button to reset the counter to "0".

2



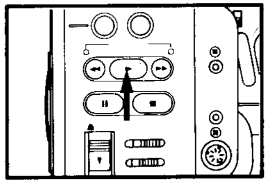
Press the MEMORY button. The "M" mark will appear.

3



After recording or playback, press the STOP button, then the REW button. The tape will automatically stop at the counter reading of around "0".

4



Press the PLAY button to start playback.

Notes:

- The counter memory function is effective in the Fast Forward mode as well.
- To cancel the memory function, press the MEMORY button.
- When the power supply unit is disconnected, all indications on the LCD display disappear and the counter memory function is cancelled.

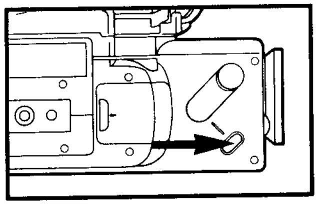
SPECIAL TECHNIQUES

Fade-in/out

The GR-45E is equipped with an automatic fade mechanism for allowing smooth fade-in and fade-out with a black-coloured blank screen. Audio also fades in sync with video.

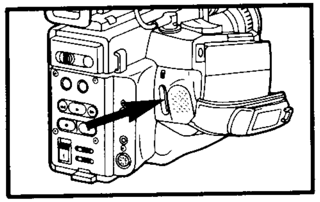
Automatic fade-in

1



Determine the composition in the Recording Standby mode and press the FADER button to reserve the fade-in mode.

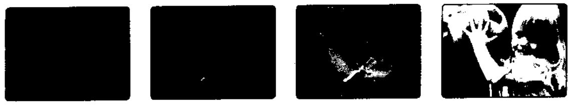
2



Press the start/stop button. The screen will quickly become black and recording begins. When the start/stop button is released, fade-in will start. It will be completed in 5 seconds. If the start/stop button is not released when pressed, the black picture will remain on the screen and be recorded.

FADER is displayed in the viewfinder when fading is reserved, and continues to be displayed until fading in or out is completed.

Fade-in ⟶

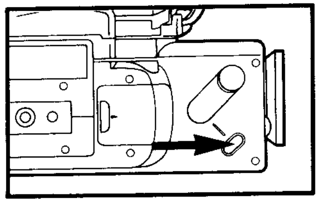


⟵ Fade-out

Automatic fade-out

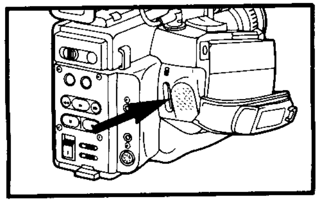
1 Start shooting as usual.

2



Press the FADER button to reserve the fade-out mode.

3



Press the start/stop button. Fade-out will start and be completed in 5 seconds. When completed, Recording standby mode is entered. If the start/stop button is not released when pressed, the final black picture remains on the screen and continues to be recorded, until the button is released.

Warning on lithium battery
- **Dispose of used battery promptly.**
- **Keep away from children.**
- **Do not disassemble and do not dispose of in fire.**

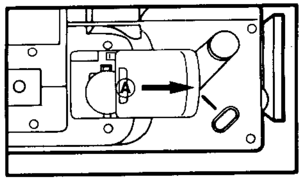
Recording the date/time

Battery insertion

This battery powers the date/time function.

1. Slide the cover off the CLOCK BATTERY compartment on the bottom of the VideoMovie by pressing lightly on the section labelled Ⓐ in the diagram.
2. Insert the provided lithium battery **with the plus (+) side up.**
3. Slide the cover on until it clicks.

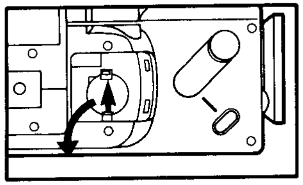
Notes:
- Switch off the unit's power before inserting the battery.
- When the battery is inserted, the clock will begin functioning.



Battery replacement

The battery lasts for about one year. When the lithium battery warning (▶ E) appears in the viewfinder, this battery needs to be replaced. Obtain a new CR 2025 lithium battery and follow the following procedure.

1. Remove the battery by pressing the knob in the direction of the arrow.
2. Insert the new CR 2025 **with the plus (+) side up.**
3. Slide the cover back until it clicks.



Note:

Switch off the unit's power before removing old battery.

Replace battery with Matsushita type CR 2025 only. Use of another battery may present risk of fire and explosion.

Date/time setting

Before adjusting the date and time for the first time or after replacing the batteries, 1. 1. 87 blinks in the viewfinder, indicating the clock needs to be set.

①Switch the unit's power on, 1.1.87 will blink in the viewfinder. Press MONITOR button to enter Rehearsal mode.

②Press the DATE/TIME SELECT button – the year blinks.

③Press the DATE/TIME SET button to choose the correct number.

④Press the DATE/TIME SELECT button to select the next item to change, with the item selected changing in the following sequence:

→ Year → Month → Day → Hour → Minute → Finish Adjustment ┐

⑤Repeat steps ② and ③ to set all items. After the minute setting has been performed, press the DATE/TIME SELECT button, and items will cease blinking. For the auto date record mode, the auto date record reserve indicator will appear.

Date/time recording

The date, time, or date and time can be displayed and recorded according to the selected mode. Press the DISPLAY SELECT button to cycle through the modes in the following order:

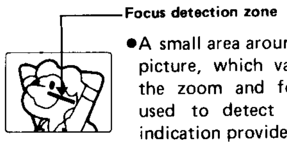
→ Auto date record reserve → Date display → Date/time display → Time display ┐

- When the auto-date-record function is selected, "–.–.–" appears in the viewfinder, until recording begins. As long as this function is chosen, the date will be automatically displayed and recorded for about 5 seconds following the first operation of the recording start/stop button after the power is turned on.
- Auto date record reserve indication will cease to be displayed about 5 seconds after the date is recorded if the DATE/TIME REC ON/OFF button is set on OFF unless power is provided again.

Date/time recording indications

Auto date record		Date display	Date/time display	Time display
– – – Auto date record reserved	31.12.87 Auto date record executed	31.12.87	31.12.87 14:30	14:30

Auto-focus

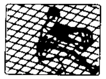
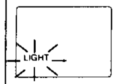
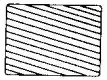
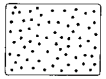


- A small area around the center of the picture, which varies depending on the zoom and focus conditions, is used to detect focus. (No actual indication provided on the screen.)

CAUTION

- Do not touch the focus ring while the auto-focus mechanism is in operation.
- Be careful not to cover the auto-focus sensor window, otherwise accurate focusing will not be possible.
- When not in use, do not leave the VideoMovie in the Autofocus mode with power on; otherwise light entering the auto-focus sensor window will operate the auto-focus mechanism, consuming power.

Correct focus may not be obtained in the following situations. In such cases manual focusing should be performed to obtain proper focus.

	Two subjects at different distances overlap in the same scene.		Low illumination where the under-exposure indicator appears on the Viewfinder screen.
	Slanted lines only.		Minute patterns or identical patterns that are regularly repeated.

Note:

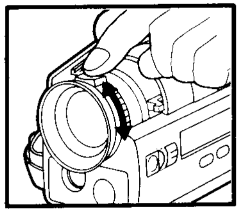
- If the lens and/or auto-focus sensor window are smeared with staint or blurred with condensation, accurate focusing is not possible. Keep them clean. If they become dirty, wipe with a piece of soft cloth. When condensation occurs, dry them by wiping with a soft cloth or wait for conditions in which they become dry.

One-hour recording

- To record longer on a single cassette, use the LP (Long Play) mode.
- For LP recording, a higher-capacity battery pack may be used.
- For worry-free shooting, it is recommended that you prepare battery packs for 3 or 4 times the length of time required for the intended recording.

Manual focus

If the manual focus mode is selected, proceed as follows:



① Zoom in on a subject by pressing the "T" button.
② Focus onto it by turning the focus ring.
③ Determine the composition by pressing the "W" button.

Caution:
Convering the white balance sensor while manually focusing will result in poor colour reproduction.

Note:

- When you use the manual focus mode, be sure to focus the lens in the maximum telephoto position. If you focus in on a certain subject in the wide-angle position, sharply-focused images cannot be obtained when zoomed up because the depth of field is reduced at longer focal lengths.

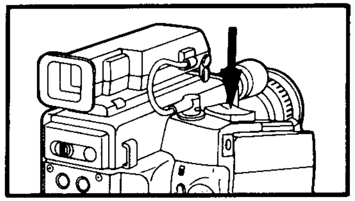
FOCUS INDICATORS

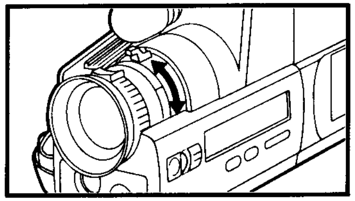
The focus indicators on the viewfinder screen function in the manual focus mode.

Condition	Indication	Corrective operation
Focus point behind the subject	▶	Turn the focus ring clockwise until the center square lights.
Correct focus	■	Keep the focus ring in the same position.
Focus point in front of the subject	◀	Turn the focus ring counterclockwise until the center square lights.
Indication not possible because of low contrast	—▶ ■ ◀—	Estimate the subject distance and set the focus ring referring to the distance scale on it.

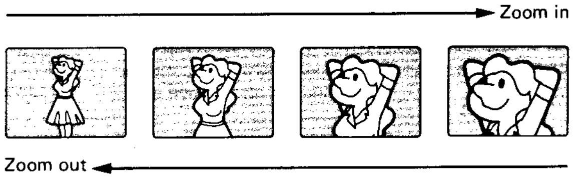
Zooming

When the focal length of the lens is varied by turning the zoom ring, the image appears to come nearer to or retreat from the viewer.





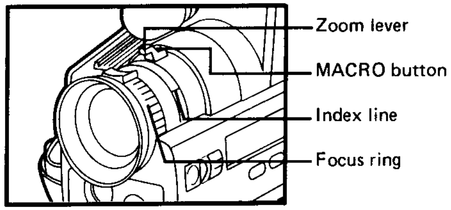
Power zooming
Press "T" for zooming in and "W" for zooming out. Two zooming speeds are available. For slow-speed zooming, press lightly. For regular-speed zooming, press firmly.



Manual zooming
Rotate the zoom lever downwards for zooming in and upwards for zooming out.

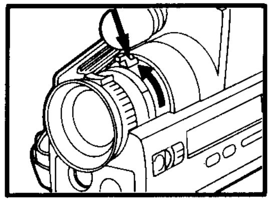
Macro Shot

Normally, focusing is possible only for subjects that are more than 1.1 m away from the camera. By setting the lens to the Macro mode, it is possible to manually focus in on any subject located inside that limit, right up to the front of the lens. The MACRO and ZOOM ranges combined give continuous shooting ability from close-up to infinity.



Engage MACRO

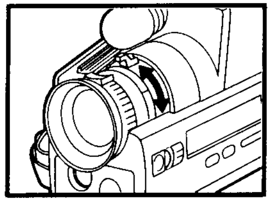
1



While pressing in the macro button, turn the zoom lever in the direction of the arrow until the number "9" on the zoom ring passes the index line.

Focus

2

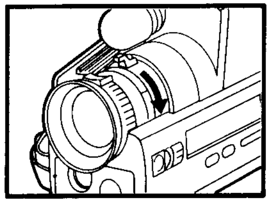


Focus by turning the zoom lever slowly.

- Use the zoom lever to focus in the MACRO range.
- Turning the Focus ring will slightly alter the angle of view of the lens.
- The zoom and auto-focus mechanisms do not function during macro shooting.

Release MACRO

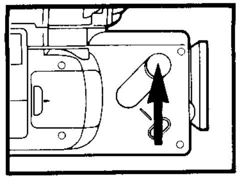
3



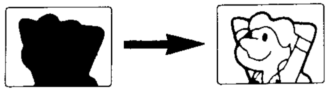
To release the Macro mode, turn the zoom lever in the direction of the arrow until the number "9" passes the index line.

Backlight compensation

- *Press the BLC button.* While it is being pressed, the iris is 1–2 f-stops wider than that adjusted automatically.

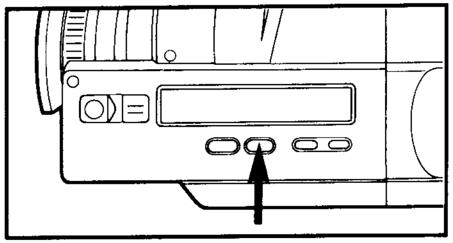


When excessive lighting is located in back of the subject, correct exposure may not be obtainable. To compensate for this, use BLC.


Without BLC With BLC

High-Speed Shutter

The GR-45E is equipped with a selectable high-speed shutter that allows better recording of quick movements for sharp, clear stills or slow-motion playback.



1. Press the SHUTTER button to switch to a desired speed. This can be done while recording or in any other mode. It continues until switched to another.
2. When finished recording the fast-action scene, switch back to the standard shutter speed by pressing the SHUTTER button until STD appears on the LCD display.

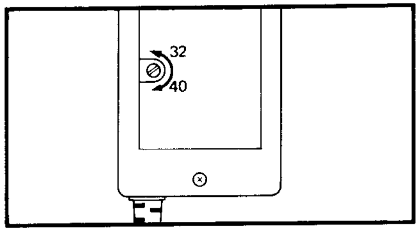
→ STD → 1/250 → 1/500 → 1/1000
(1/50)

Note:
The High-Speed Shutter mode requires slightly more subject illumination than the Standard Shutter mode. Therefore, the low-light warning may blink in the viewfinder. If so, switch to the Standard Shutter mode.

CONNECTION TO A TELEVISION FOR PLAYBACK

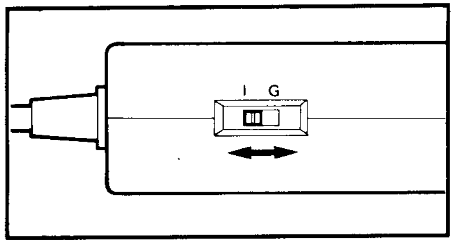
The GR-45E includes playback circuits and allows playback of pre-recorded casettes simply by connecting to a television set.

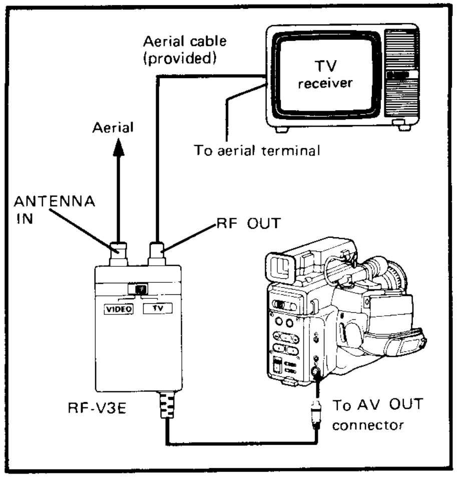
1. Remove the aerial cable from the TV receiver.
2. Connect the aerial cable to the ANTENNA IN terminal of the RF unit.
3. Connect the RF OUT terminal of the RF unit to the aerial terminal of the TV receiver using the provided aerial cable.
4. Connect the VIDEO/AUDIO INPUT cable of the RF unit to the AV OUT connector of the GR-45E.
5. Adjust the RF converter output channel according to your VIDEO CHANNEL.



•RF converter channel adjustment screw
The RF unit permits playback of video and audio recordings through a TV receiver. The signals from the RF unit are viewed through a vacant channel not used for broadcasting in your area. The output frequency of the RF converter has been set to correspond to a broadcast on UHF channel 36. To view playback pictures from the GR-45E with your TV receiver, tune its specified AV channel to UHF channel 36. If channel 36 is employed for broadcasting in your area, readjust the RF converter output channel to one of the vacant channels between 32 and 40. To make this adjustment, remove the small cap on the back of the RF unit and turn the adjustment screw with a screwdriver to tune in a vacant channel.

•TV system select switch (I/G)
When you use a TV receiver built to the British PAL standard, shift the system select switch to "I".





•RF converter channel adjusting procedure
1. Set the AV channel of the TV receiver to one of the vacant channels.
2. Power the GR-45E.
3. Put the GR-45E in the Rehearsal mode (see page 11).
4. Set the VIDEO/TV switch of the RF unit to VIDEO.
5. While monitoring the output signal on the TV screen, turn the RF converter channel adjustment screw so that the monitored picture comes in most clearly.

- When you wish to view video cassette programmes, always select the AV channel on the TV receiver which has been tuned to the output frequency of the RF converter.

PRECAUTIONS FOR RF-V3E
- For exclusive use with the GR-45E VideoMovie.
- Do not disassemble or remodel the RF-V3E.
- Do not expose it to strong shocks.
- Unplug the connected equipment during lightning storms. (Never touch the aerial cable.)

CAUTION:
To view the GR-45E recordings with a TV receiver, use a TV receiver having a specified AV channel and employ this AV channel as your VIDEO CHANNEL, otherwise playback may be disturbed with vibrating or bending pictures. AV channels refer to channels exclusively for video playback; because of AFC circuits applied to these channels, the playback pictures can be stabilised. Recent TV receivers have one or more AV channels.

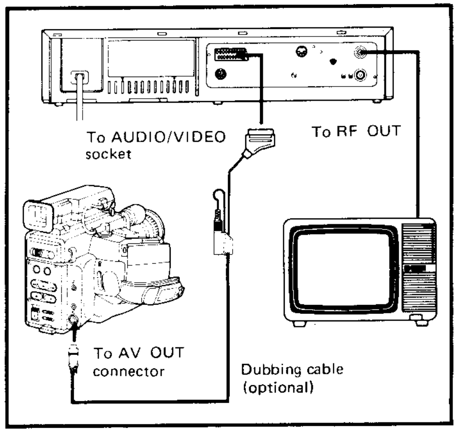
OPERATION
Viewing video cassettes being played back with the GR-45E
To view video cassettes or to monitor the recording, set the VIDEO/TV switch of the RF unit to VIDEO and the TV channel selector to the channel corresponding to the RF output channel.
Viewing television programmes
Set the VIDEO/TV switch to TV, and the TV receiver will function as usual.

TAPE DUBBING OR EDITING

Dubbing onto a standard recorder

Connection
1. Connect the AV OUT connector of the GR-45E to the AUDIO and VIDEO IN connectors of the video recorder using the optional dubbing cable.
2. Connect a television to the video recorder to monitor the picture while dubbing.
3. Set the DUBBING ON/OFF switch to ON.

Operation
- Put the GR-45E in the Play mode and the connected recorder in the Record mode to copy the recording. To edit out unwanted material, press the recorder's PAUSE button.

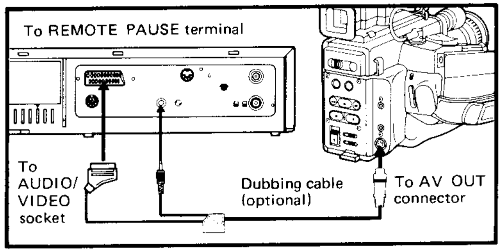


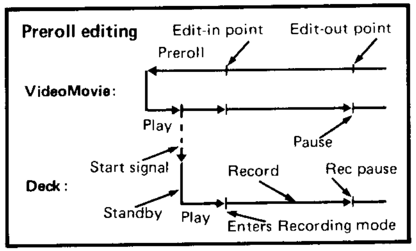
Using the Master Edit Control System

This function is available when using designated JVC video decks equipped with a remote pause terminal. The Master Edit Control system allows control of the connected deck using the VideoMovie's controls, preroll editing for edits free of transition-point gaps and distortion.

Connection

1. Connect the AV OUT connector of the GR-45E to the AUDIO and VIDEO IN connectors and remote pause terminal of the video recorder.
2. Connect a television to the video recorder to monitor the picture while dubbing.
3. Set the DUBBING ON/OFF switch to ON.





Operation

Dubbing can be initiated from Stop mode or Still mode.

●For dubbing a tape

1. Switch on the VideoMovie's power.
2. Switch on the deck's power.
3. Put the deck in the Record-Pause mode.
4. Press the QUICK REVIEW/EDIT button to start editing. The tape is loaded, then dubbing starts.
5. Tape stop when the PAUSE/STILL or STOP button of the GR-45E is pressed or counter reaches "0M".
6. Deck stops recording and enters the Record-Pause mode

●For editing

1. Switch on the VideoMovie's power.
2. Turn on the deck's power.
3. Put the deck in the Record-Pause mode.
4. Locate the edit-in point via play, fast-forward, rewind, or Shuttle Search, and press the PAUSE/STILL button.
5. Press the QUICK REVIEW/EDIT button to start editing.
6. Tape stops when the PAUSE/STILL or STOP button of the GR-45E is pressed or counter reaches "0M".
7. Deck stops recording and enters the Record-Pause mode.

Note:

When the EDIT button is pressed from the Still mode, the tape is rewound for 5 seconds of program time. The Play indicator appears on the LCD display to indicate rewinding is taking place. After prerolling, first the prerolled section is played back for stabilizing tape run. During playback of the GR-45E, it gives a start signal to the deck standing by in the Record-Pause mode to start playback and then to enter the Recording mode at edit-in point, while the GR-45E continues playback. The Master Edit Control indicator appears on the LCD display during dubbing.

Setting the edit-out point using counter memory

In the above procedures, counter memory can be used to set the edit-out point before editing takes place, so that the VideoMovie automatically stops playback at the designated point. If the edit-out point is to be set in this way, do so following step 3 of the dubbing operation.

1. Locate the desired edit-out point on the VideoMovie's tape.
2. Press the VideoMovie's PAUSE/STILL button.
3. Reset the VideoMovie's counter to "0".
4. Press the VideoMovie's counter MEMORY button.
5. The VideoMovie enters the Pause mode, and the deck enters the Record-Pause mode.

Note:

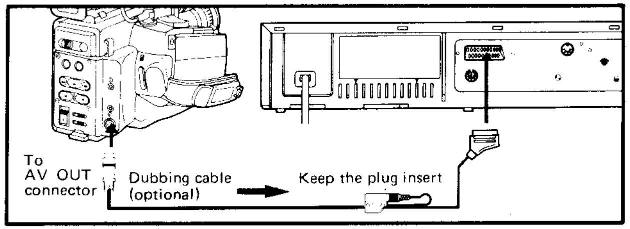
When the tape reaches the preset edit-out point during the dubbing operation, it may stop slightly before or after the designated point on the tape.

USING THE GR-45E AS A VIDEO CAMERA

For continuous documentation of longer events, the GR-45E can be used as an independent video camera in combination with either a deck-type or portable video recorder.

Using a recorder not equipped with a remote pause terminal

●Connect the AV OUT connector of the GR-45E to the AUDIO and VIDEO IN connectors of the video recorder using the optional dubbing cable.



Operation

1. Press the MONITOR button. The camera output signal is now available via the dubbing cable.
2. Put the connected recorder in the Record mode. Recording will start. Tape start/stop should be controlled with the recorder's buttons.

Note:

●In this configuration, it is possible to obtain a continuous recording and an edited-out recording of the same event simultaneously, because the GR-45E's start/stop button only controls the tape inside itself while another tape loaded in the connected recorder continues running. To record on the GR-45E's tape, follow the same recording procedure as mentioned before: press REC standby and then the start/stop button.

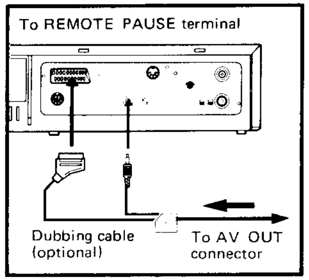
Using a recorder equipped with a remote pause terminal or with a 10-pin camera connector

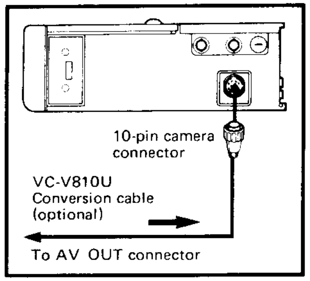
For a recorder with a remote pause terminal

●Connect the AV OUT connector of the GR-45E to the AUDIO and VIDEO IN connectors and remote pause terminal of the video recorder using the optional dubbing cable.

For a recorder with a 10-pin camera connector

●Connect the AV OUT connector of the GR-45E to the 10-pin camera connector of the second recorder using the optional VC-V810U conversion cable.





Operation

1. Press the MONITOR button.
2. Press the connected recorder in the Recording Standby (Record-Pause) mode.
   - ●The viewfinder's mode indication corresponds to the state of the connected recorder.
3. Press the start/stop button of the GR-45E to start recording.

Note:

●To record on the GR-45E's tape as well, press the REC standby button and then the start/stop button.

Precautions

●Power is not supplied to the GR-45E from the connected VCR. Independent power supply is required for both the GR-45E and the VCR.

●If you stop recording by pressing the GR-45E's start/stop button, the connected VCR also stops in the Pause mode. However, the pause command signal is not delivered to the connected VCR in the following cases and, therefore, the VCR will start automatically:

(1) when the GR-45E is switched off or its battery becomes discharged.

(2) when the VC-V810U cable is disconnected.

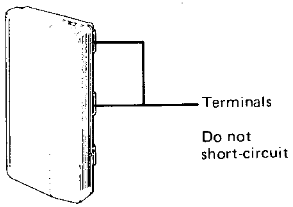
Therefore, before replacing the battery or tape for the GR-45E, put the connected VCR either in the STOP or REC LOCK mode.

CHARGING THE BATTERY PACK

To charge the battery pack, use the exclusive AC power adapter/battery charger AA-V5EG (provided/optional) or car battery charger BH-V5E (optional).

A WORD ON THE EXCLUSIVE BN-V5GU/V6GU BATTERY PACKS

The BN-V5GU/V6GU are nickel-cadmium batteries. Give attention to the following to make the most of their characteristics.



Temperature ranges:
The recharging time is based on room temperature of 20°C.
The lower the temperature, the longer the recharging time.

For charging:	10°C to 35°C
For operating:	0°C to 40°C
For storing:	-10°C to 30°C

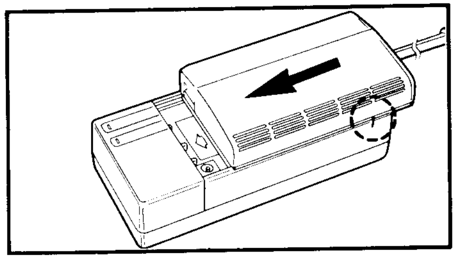
The battery pack has been kept in the uncharged state for shipment. Therefore, before use, charge it.
BE SURE TO CAREFULLY READ THE CAUTION ATTACHED TO THE BATTERY PACK.

Charging procedure

Charging time

BN-V5GU 50 min.	BN-V6GU 70 min.

- The charging time differs depending on the ambient temperature and the condition of the battery pack.



1. Connect the AC power cord to a wall outlet. (The POWER indicator will light.)
2. Align the marks on the battery pack and adapter.
3. Slide the battery pack in the direction of the arrow until it locks in place.
4. When charging is completed, the CHARGE indicator goes out.

PRECAUTIONS

- If used near a radio, the provided AA-V5EG AC power adapter/battery charger may interfere with reception.
- Prevent inflammables, water and metallic objects from entering the unit.
- Do not disassemble or modify the unit.
- Do not apply shocks to the unit.
- Do not subject the unit to direct sunlight.
- Avoid using the unit in extremely hot or humid places.
- Avoid using the unit in places subject to vibrations.

Note:
The optional BH-V5E Car Battery Charger can charge the batteries from a car battery. For details refer the instructions of the BH-V5E.

Recording time for the GR-45E

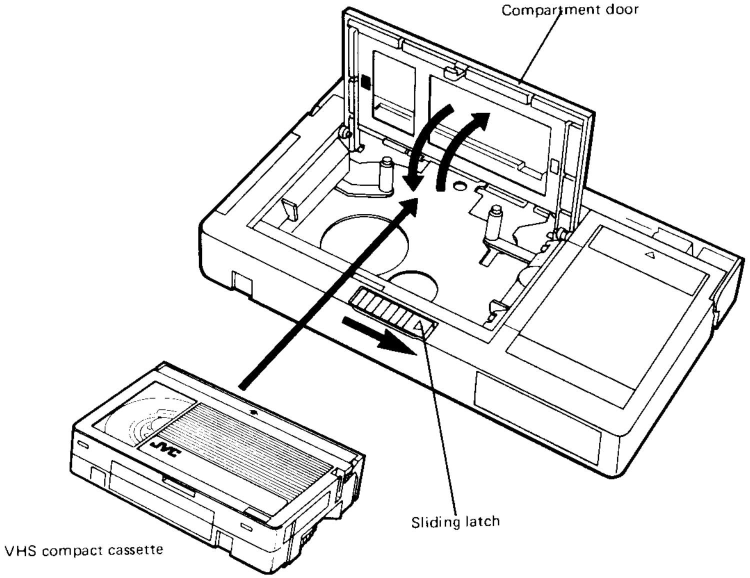
BN-V5GU 20 min.	BN-V6GU 50 min.

- The recording time per charge is influenced by the duration of recording standby, frequency of zooming, etc. It is safer to have spare battery packs.

USING THE CASSETTE ADAPTER (provided)

The VHS compact video cassettes recorded with the GR-45E can be played back with a standard VHS machine by using the provided C-P5U Cassette Adapter.
(A compact video cassette installed in the cassette adapter is fully compatible with a standard VHS machine for both recording and playback.)

- **C-P5U Cassette Adapter**
  Being battery-operated, the C-P5U performs tape loading and unloading automatically.

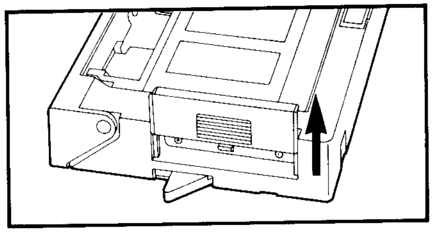


For more details refer to the instruction manual of the C-P5U.

Note:
- During special-effects playback (slow motion, still frame, etc.) the picture may vibrate or noise bars may appear on the screen.

Inserting the battery into the cassette adapter

Remove the battery cover by sliding it up.
Install one "R6" battery and reattach the cover.

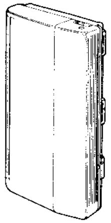


SYSTEMS FLEXIBILITY

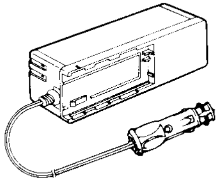
For maximum enjoyment, make the most of the provided or optional accessories depending on the situation.

① **Regular battery pack BN-V5GU**
☞ **Page 23**

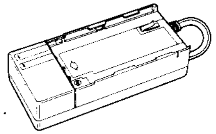
② **High-capacity battery pack BN-V6GU**
☞ **Page 23**



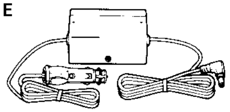
③ **Car battery charger BH-V5E**
☞ **Pages 5 and 23**
Use to charge the battery pack, or power the GR-45E using a car battery.



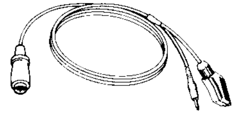
④ **AC power adapter/battery charger AA-V5EG**
☞ **Pages 5 and 23**
Use to power the GR-45E with household AC current or charge the battery pack.



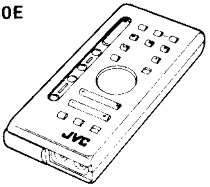
⑤ **Car battery cord AP-P1E**
☞ **Page 5**
For power supply from a car battery.



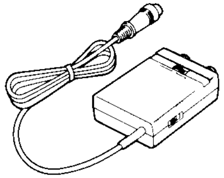
⑥ **AV dubbing cable VC-V896E**
☞ **Pages 20, 21 and 22**
Use to connect the GR-45E to a television set equipped with audio/video input connectors for playback, or to a second video recorder for dubbing.



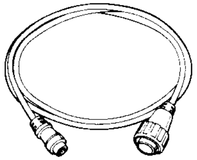
⑦ **Character generator CG-P50E**
☞ **Page 27**
Allows superimposition of titles, dates and lap time during recording.



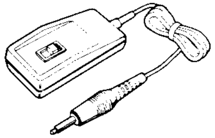
⑧ **RF unit RF-V3E**
☞ **Pages 19 and 20**
Use to connect the GR-45E to a regular TV receiver for playback.



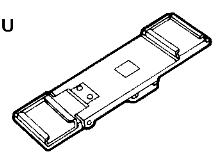
⑨ **Conversion cable VC-V810U**
☞ **Page 22**
For connecting the GR-45E to a VCR with a 10-pin camera connector.



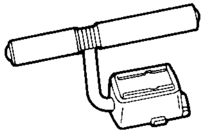
⑩ **Remote control unit RM-P1U**
☞ **Page 27**
Controls recording start/stop from a distance.



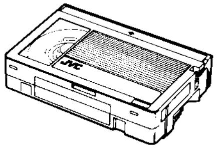
⑪ **Shoe adapter CU-V410U**
☞ **Page 27**
Use to attach microphone, character generator etc.



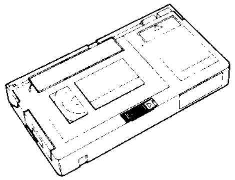
⑫ **Carrying handle VU-V130U**
☞ **Page 27**
Use to carry GR-45E.



⑬ **Compact video cassette EC-30**
☞ **Page 3**
Allows 30 minutes of recording and playback in SP mode, and 60 minutes of recording and playback in LP mode.

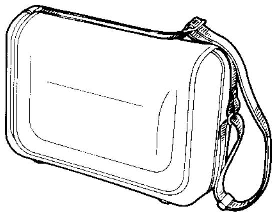


⑭ **Cassette adapter C-P5U**
☞ **Page 24**
Enables the EC-30 compact video cassette to be used with regular VHS machines.

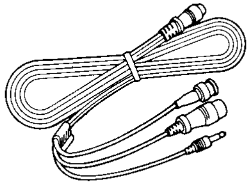


⑮ **Carrying case CB-V55U**
Use to carry the GR-45E together with accessories.

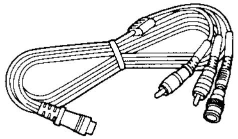
⑯ **Carrying bag CB-V40U**
Use to carry the GR-45E together with basic accessories.



⑰ **AV dubbing cable VC-V856E**



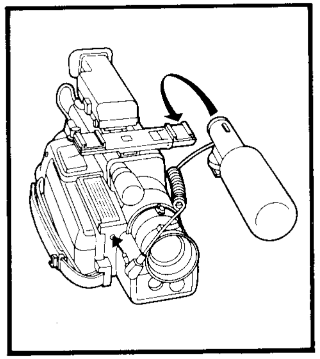
⑱ **AV output cable VC-V826E**



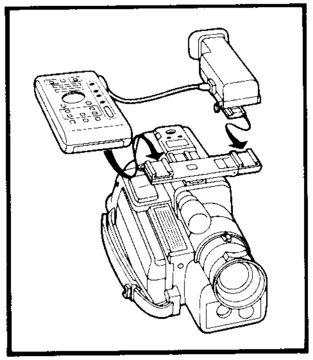
Choose the appropriate cable depending on the type of VCR you have.

SHOE ADAPTER (optional)/ CARRYING HANDLE (optional)

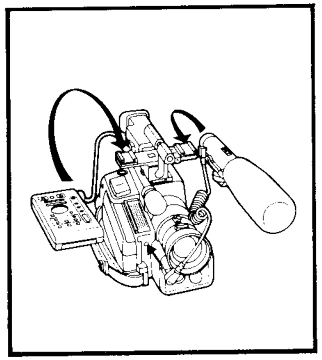
Attaching external microphone using shoe adapter.



Attaching character generator using shoe adapter.



Attaching character generator and external microphone using shoe adapter and carrying handle.



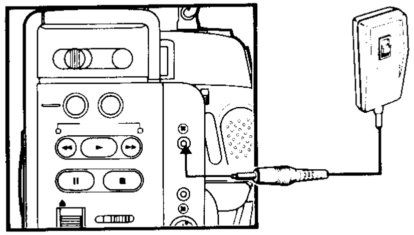
CAUTION
- Do not attach a video light, its heat could cause malfunctioning of the GR-45E.

Notes:
- Do not adjust the viewfinder angle while using shoe adapter.
- Keep carrying handle in up position while attaching accessories.
- Run the microphone cord behind the shoe adapter.

REMOTE CONTROL UNIT (optional)

The remote control unit RM-P1U (optional) permits recording start/stop to be controlled from a distance.

1



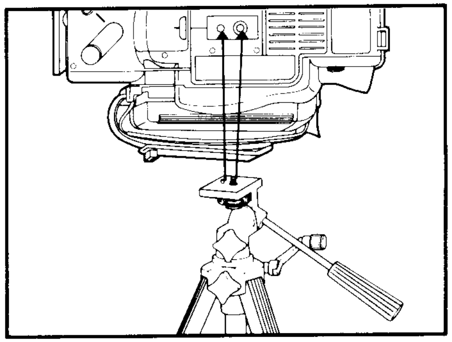
Plug the remote control cable into the REMOTE connector.

2 Press the standby button to engage the Recording Standby mode.

3 To start recording, set the remote control's switch to REC; to stop temporarily, set it to PAUSE.

Note:
Fader will not function when remote control unit is connected.

TRIPOD MOUNTING



Align the screw and camera direction stud of the tripod with the camera's tripod mounting socket and stud hole, and firmly tighten the screw.

SUPPLEMENTAL INFORMATION

What is "colour temperature"?
Light is composed of various colour components in different proportions. A relationship exists between the temperature of a light source and the colour components of the emitted light; as the temperature rises, the colour of the light varies from red, orange, yellow, white to blue in that order. "Colour temperature" is a value that expresses differences in colour among light sources, measured in Kelvin degrees. Bluish light has a higher colour temperature than reddish light.

What is "white balance"?
Making the colours look natural on TV is what white balance is all about. Because a camera is not as adaptable as the human eye, if a light source is reddish, white subjects in that light are recorded as reddish. White balance adjustment is performed to compensate for colour temperature variations of light so that whites are reproduced as white. Correct white balance makes all other colours correct. The GR-45E can perform automatic white balance adjustment in the full-auto mode. However, if illumination is insufficient, white balance adjustment cannot be performed. To obtain correct colours, therefore, sufficient illumination is essential.

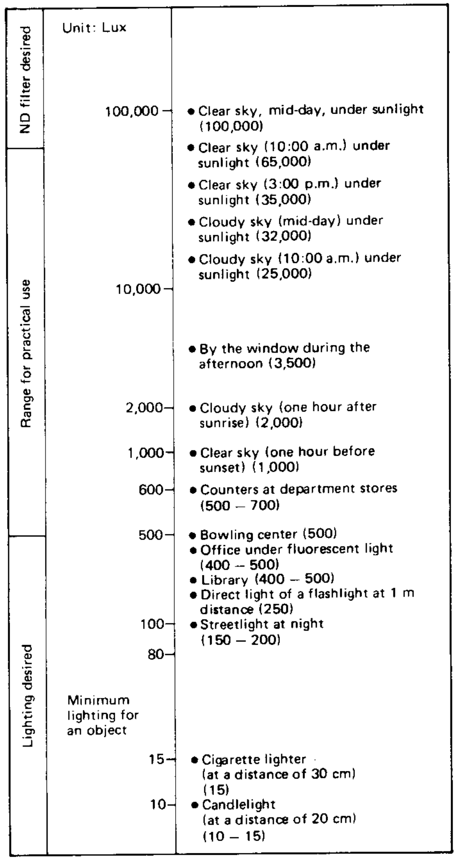
What is "illuminance"?
"Illuminance" (also called 'luminance') is the intensity or brightness of light, expressed in lux. The GR-45E is designed to provide best pictures under the conditions of a 700-lux illuminance, although shooting is possible all the way down to 10 lux. To obtain good pictures in very bright light, the use of an ND (neutral density) filter is recommended. (See chart on this page.)

How to get good colour pictures
The simplest way is to provide sufficient lighting (close to the camera's reference illuminance) and accurately adjust the camera to the colour temperature of that lighting. If light sources of different colour temperatures are used together, accurate white balance adjustment is very difficult. For example, if natural light is mixed with artificial light, which is likely to occur next to windows, correct colours of the subject are difficult to obtain. It is recommended in such cases that curtains in the room be closed to shut out light from outside. Also, when artificial lighting devices are used, they should all have the same colour temperature. For example, it is recommended that incandescent or halogen lamps not be used together with fluorescent lighting.

Colour temperatures of various artificial lighting

Type of illumination		Colour temperature
Tungsten lamp for home use		2800 K
Tungsten lamp for photographic use		3200 K
Quartz-halogen lamp		
Blue lamp for photographic use		5000 K
Fluorescent lamp	Warm white	3500 K
	White	4500 K
	Daylight type	6500 K

Illuminance chart
- The values on this chart are approximated to give you a rough reference.



IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first . . . .

Symptoms	Check points
Power	
No power is supplied.	●Is the battery pack correctly installed? ●Is the battery pack charged? ●Is the power supply unit correctly connected? ●Is the POWER switch of the connected AC adapter set to ON?
Recording	
Recording is impossible.	●Check to see if the cassette safety tab is in place. See page 3.
Picture colours greatly differ from actual subject colours	●If in the manual white balance mode, check the setting of the ☼/▭/☼ button.
No sound is recorded with an external microphone.	●Is the microphone's switch set to ON?
Recording does not start.	●Have you pressed the REC standby button first?
Playback	
Tape is running, but no playback picture appears.	●Is the VIDEO/TV switch of the RF unit set to VIDEO? ●Is the TV receiver set to your video channel?
Noise bars appear in the playback picture.	●Use the TRACKING control to reduce noise bars.
Playback picture is blurred or interrupted while TV programmes received are clear.	●Video heads may be dirty or worn out. For head cleaning or replacement, consult the nearest JVC dealer.
Tape transport	
Tape stops during fast forward or rewind.	●Is the "M" indication visible in the tape counter? If so, press the MEMORY button to cancel the memory function.
Rewinding or fast forwarding is impossible.	●Check to see if the tape has already been fully wound on one reel or the other.
Other	
No function is available with more than two mode indicators lit.	●If this should happen when using power supply units other than the battery pack, turn their POWER switch on and off. With a battery pack, replace it with another charged one.
Vertical white lines appear when shooting a very bright object.	●This may occur when the background contrasts very much with the object. This is normal.

The GR-45E is a microcomputer-controlled device. External noise and interference might prevent it from functioning properly. In such cases, first disconnect its power supply unit (battery pack, AC power adapter, etc.); and then reconnect it and proceed as usual from the beginning.

SPECIFICATIONS

Format : VHS standard
Power source : DC 9.6 V ⎓
Power consumption : **8.5 W**
Signal system : PAL
Recording system : Luminance: FM recording
Colour: Converted sub-carrier direct recording
Conforms to VHS standard
Cassette : VHS-C cassette
Tape speed (SP) : 23.39 mm/sec
(LP) : 11.70 mm/sec
Recording time
Max. (SP) : 30 minutes (with EC-30 cassette)
(LP) : 60 minutes (with EC-30 cassette)

VIDEO

Output : 1 Vp-p, 75 ohms, unbalanced (via AV OUT connector)
S/N ratio : More than 43 dB (with Rohde & Schwarz noise meter)

AUDIO

Output : -6 dBs, 1 k-ohm (via AV OUT connector)
Microphone input : -68 dBs, high impedance, unbalanced

Pickup : 1/2"-format CCD
Minimum required illumination : 10 lux (at F/1.4)
Illumination range : 10 – 100,000 lux
Lens : F/1.4 ~ 2.0, f = 9 – 54 mm, 6:1 two-speed power zoom lens with auto iris control and macro position, filter diameter 49 mm
Viewfinder : Electronic viewfinder with 0.6" black/white CRT
Selectable high-speed shutter : 1/250, 1/500, 1/1000 second
Colour temperature switching : Switchable (3,200 K/4,500 K/5,500 K)
White balance adjustment : Full-auto/preset standard
Operating temperature : 0°C to +40°C
Operating humidity : 35 % to 80 %
Storage temperature : -20°C to +50°C
Weight : 1.2 kg (with viewfinder)
Dimensions : 110(W) x 149(H) x 243(D) mm (incl. viewfinder)

AA-V5EG SPECIFICATIONS

Power requirement : AC 110 – 240 V∿, 50/60 Hz
Power consumption : 21 watts
Output : DC 14 V ⎓ 1.1A (Charge)
DC 9.6 V ⎓ 1.2A (VideoMovie)
Charging system : Constant current, peak detection, timer controlled
Dimensions : 68(W) x 38(H) x 150(D) mm
Weight : Approx. 340 g

C-P5U SPECIFICATIONS

Type : VHS cassette adapter
Dimensions : 188(W) x 25(H) x 104(D) mm
Weight : 235 g
Accessory : "R6"-size battery x 1

RF-V3E SPECIFICATIONS

Output channel : UHF channel 32 – 40 (adjustable)
Initial channel setting : UHF 36
Power source : DC 8 V ⎓ 20 mA (from VideoMovie)
Dimensions : 52(W) x 80(H) x 24(D) mm excl. cable
Cable length : 2.5 m
Weight : Approx. 160 g

Provided accessories:

AC power adapter/battery charger AA-V5EG
Cassette adapter C-P5U
Cassette tape EC-30
Battery pack BN-V6GU
RF unit RF-V3E
Shoulder strap
Electric viewfiner
Lens cap
Lens hood
Battery for clock operation

For optional accessories, refer to pages 25 and 26.

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

SECTION 1
GENERAL DISASSEMBLY

1.1 DISASSEMBLY

1.1.1 Electronic viewfinder (E. VF)

1. Disconnect the 8-pin connector as shown in Fig. 1-1-1. Slightly pressing the slide knob in the direction of Ⓐ, move the electronic viewfinder in the direction of Ⓑ to remove it.

1.1.2 E. VF shoe and upper case

1. See Fig. 1-1-2(A).
   Remove screws Ⓐ securing the VF shoe cover first, and then, raise the VF shoe spring's pawls portion upward with a screwdriver (–) and move it in the direction of the arrow Ⓒ to remove the VF shoe spring.
2. Remove screws Ⓓ shown in Fig. 1-1-2(A) to remove the VF shoe.
3. Remove a screw Ⓔ and Ⓕ shown in Fig. 1-1-2(A) and screws Ⓖ, Ⓗ, Ⓘ and Ⓙ shown in Fig. 1-1-2(B) to remove the upper case.
   Then, disengage the connectors which connect the LCD module and the main board with flexible wires as shown in Fig. 1-1-2(C).

Notes:

- The screw Ⓘ shown in Fig. 1-1-2(B) is the longest one securing the optical bracket of the camera section.
- When disassembling and re-assembling this section, pay the most careful attention to the flexible wires as they are formed in soft films.

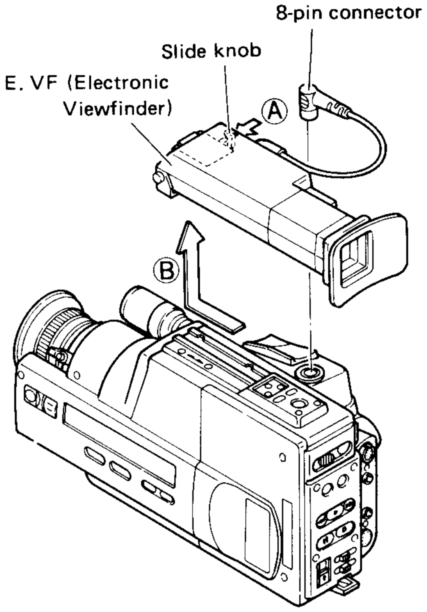

8-pin connector
Slide knob
E. VF (Electronic Viewfinder)
Ⓐ
Ⓑ

Fig. 1-1-1

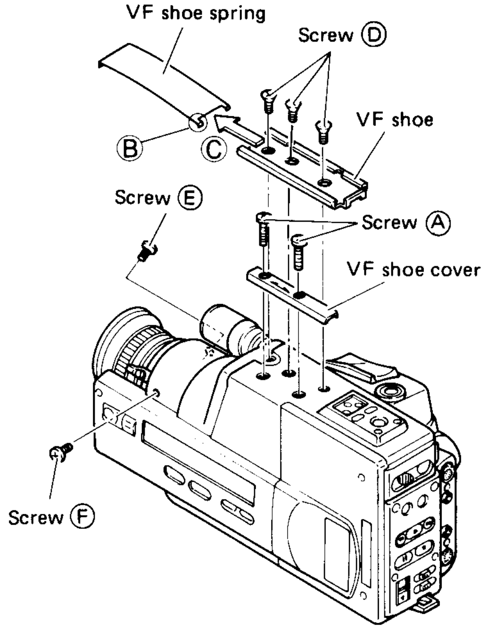

VF shoe spring
Screw Ⓓ
VF shoe
Ⓑ
Ⓒ
Screw Ⓔ
Screw Ⓐ
VF shoe cover
Screw Ⓕ

Fig. 1-1-2(A)

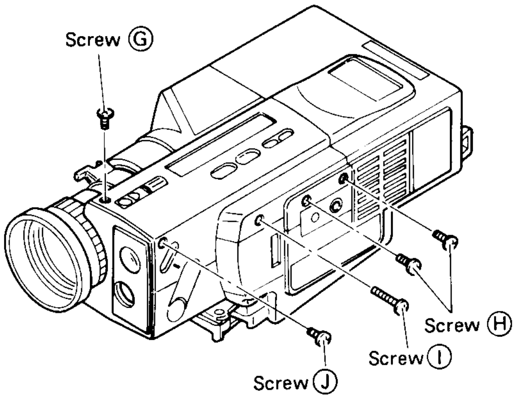

Screw Ⓖ
Screw Ⓗ
Screw Ⓘ
Screw Ⓙ

Fig. 1-1-2(B)

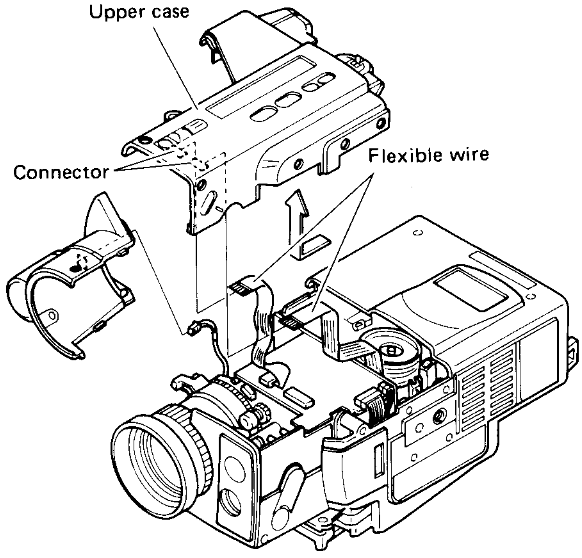

Upper case
Connector
Flexible wire

Fig. 1-1-2(C)

1.1.3 Camera section

1. See Fig. 1-1-3.
   Remove screws Ⓐ and Ⓑ securing the front panel to remove it.
   Next, remove screws Ⓒ and Ⓓ securing the lower case and a screw Ⓔ securing the camera section. Then, the lower case and the lens can be disassembled, and at this stage, make sure to remove the flexible wire Ⓕ and connectors Ⓖ and Ⓗ.

Note: At the above procedure, pay attention to the flexible wires and other wires connecting the lower case and the camera section.

1.1.4 Cassette cover and deck section (Fig. 1-1-4)

1. Remove two screws Ⓐ securing the cassette cover. Then, lift the cassette cover in the direction Ⓑ to remove it.
2. Remove four screws Ⓒ securing the operation unit. At removing the operation unit, pay attention to the connectors connecting it with the deck section.
3. As indicated in Fig. 1-1-4, take out 3 screws Ⓓ , screw Ⓔ and 2 screws Ⓕ . Disconnect connectors Ⓖ , Ⓗ and Ⓘ . Remove the shoe bracket in the direction shown by arrow Ⓙ . The shoe bracket can be more easily removed by spreading the lower case in the direction shown by arrow Ⓚ .

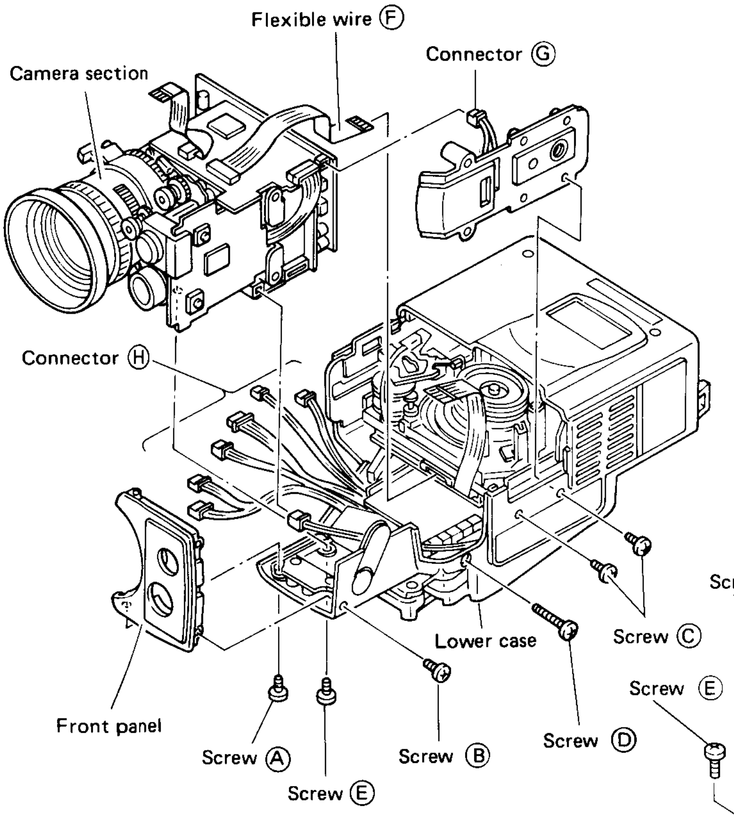

Flexible wire Ⓕ
Connector Ⓖ
Camera section
Connector Ⓗ
Front panel
Screw Ⓐ
Screw Ⓔ
Screw Ⓑ
Lower case
Screw Ⓓ
Screw Ⓒ

Fig. 1-1-3

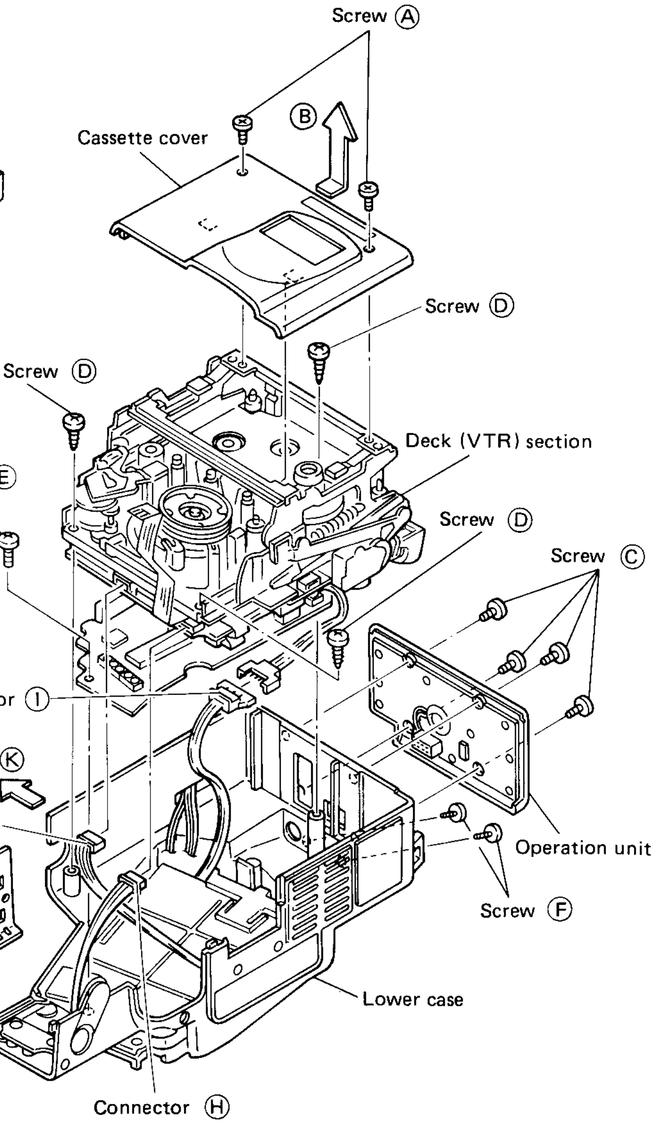

Screw Ⓐ
Cassette cover
Ⓑ
Screw Ⓓ
Screw Ⓓ
Deck (VTR) section
Screw Ⓔ
Screw Ⓓ
Screw Ⓒ
Connector Ⓘ
Ⓚ
Connector Ⓖ
Operation unit
Screw Ⓕ
Ⓙ
Shoe bracket
Lower case
Connector Ⓗ

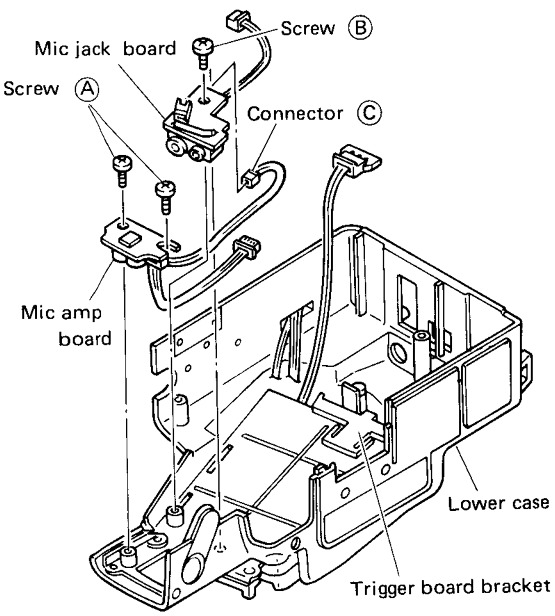
Fig. 1-1-4

1.2 REMOVAL OF CIRCUIT BOARDS

1.2.1 Deck section

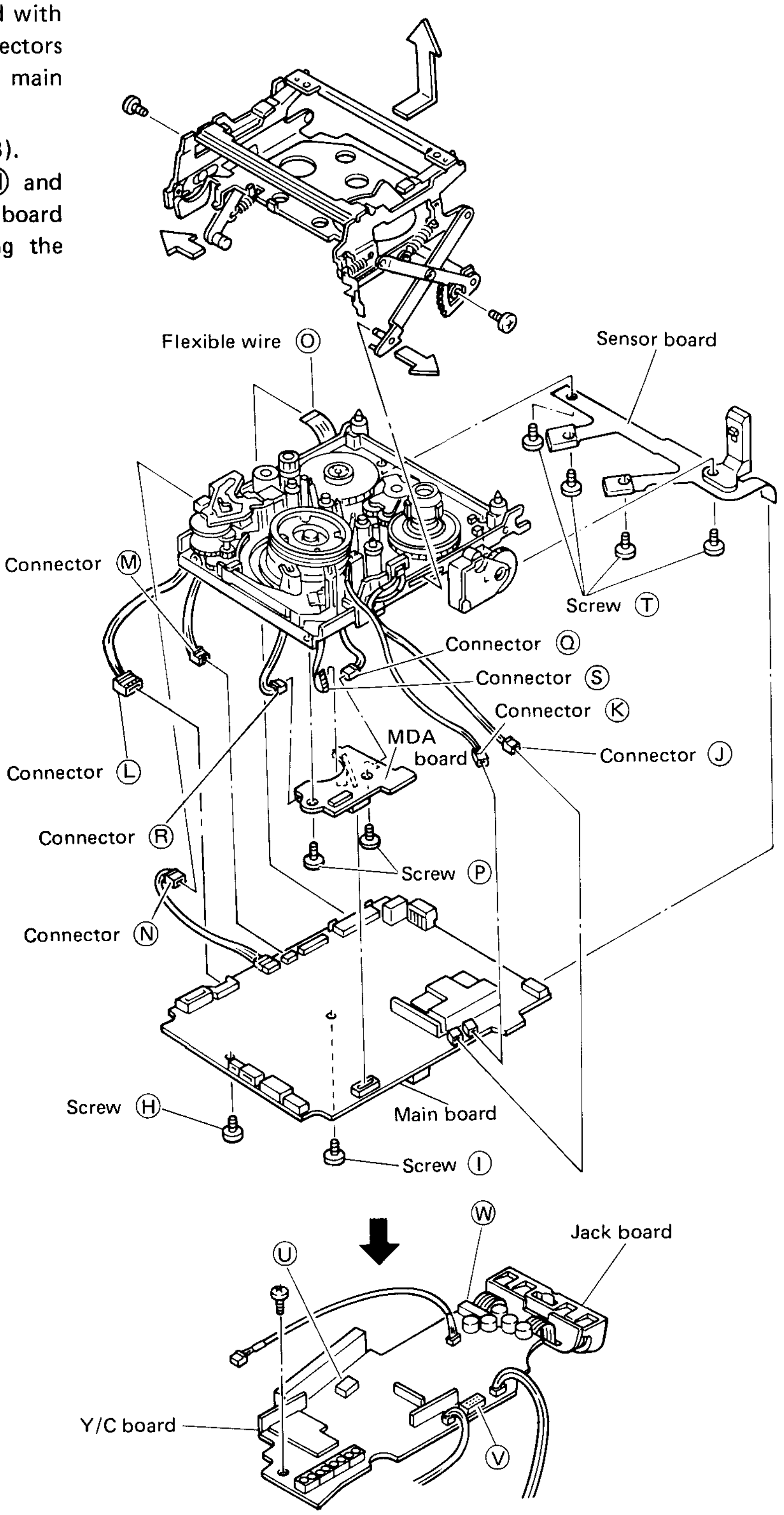
1. Remove the MIC AMP board after removing two screws Ⓐ and then disconnect connector Ⓒ Next, remove the MIC JACK board by removing screw Ⓑ . Shown in Fig. 1-2-1(A).
2. The TRIGGER board can be removed by removing the board bracket.
3. As indicated in Fig. 1-2-1(B), raise the cassette housing with one hand and shift the Y/C board downward with the other hand. The Y/C board together with connectors Ⓤ , Ⓥ and Ⓦ can be removed from the main board.
4. Remove screws Ⓗ and Ⓘ shown in Fig. 1-2-1(B). Disconnect connectors Ⓙ, Ⓚ, Ⓛ, Ⓜ and Ⓝ and the flexible wire Ⓞ , and then remove the MAIN board with careful attention to connectors connecting the MAIN board and the deck section.
5. Remove the SENSOR board by removing four screws Ⓣ shown in Fig. 1-2-1(B).
6. Remove two screws Ⓟ to remove the MDA board, and carefully disconnect connectors Ⓠ, Ⓡ and Ⓢ between the MAIN and DRUM boards.

Note: When performing above the procedures, pay enough attention to flexible wires and every wiring of the deck section not to damage them.



Screw Ⓑ
Mic jack board
Screw Ⓐ
Connector Ⓒ
Mic amp board
Lower case
Trigger board bracket

Fig. 1-2-1(A)



Flexible wire Ⓞ
Sensor board
Connector Ⓜ
Screw Ⓣ
Connector Ⓠ
Connector Ⓢ
Connector Ⓚ
MDA board
Connector Ⓙ
Connector Ⓛ
Connector Ⓡ
Screw Ⓟ
Connector Ⓝ
Screw Ⓗ
Main board
Screw Ⓘ
Ⓦ
Jack board
Ⓤ
Y/C board
Ⓥ

Fig. 1-2-1(B)

1.2.2 Camera section

1. See Fig. 1-2-2.
   Remove two screws Ⓐ securing the VIDEO-1 board first, and remove two screws Ⓑ securing the FAW board. At this time, pay careful attention to the two washers Ⓒ tightened together with not to mis or drop them.
   As all boards except the VIDEO-1 board are wired with connectors each other, connectors between the camera section and the IND board/ENC board can be disengaged by drawing out the boards sidewards.
2. Carefully draw out the connector Ⓓ of the IND board since it is directly connected with the VIDEO boards. Next, disconnect the connector Ⓔ to remove the IND board.
3. After removing the insulator Ⓕ, disconnect connectors Ⓖ and Ⓗ connected directly with the VIDEO-1 board as shown in Fig. 1-2-2.
   The ENC board can be removed by disconnecting connectors Ⓘ and Ⓙ.
4. To remove the VIDEO-2 board, remove two screws securing the DC-DC converter (refer to the "Optical Block Assembly") and the converter from the camera section first since the VIDEO-2 board is directly connected to the VIDEO-1 board with the connectors.

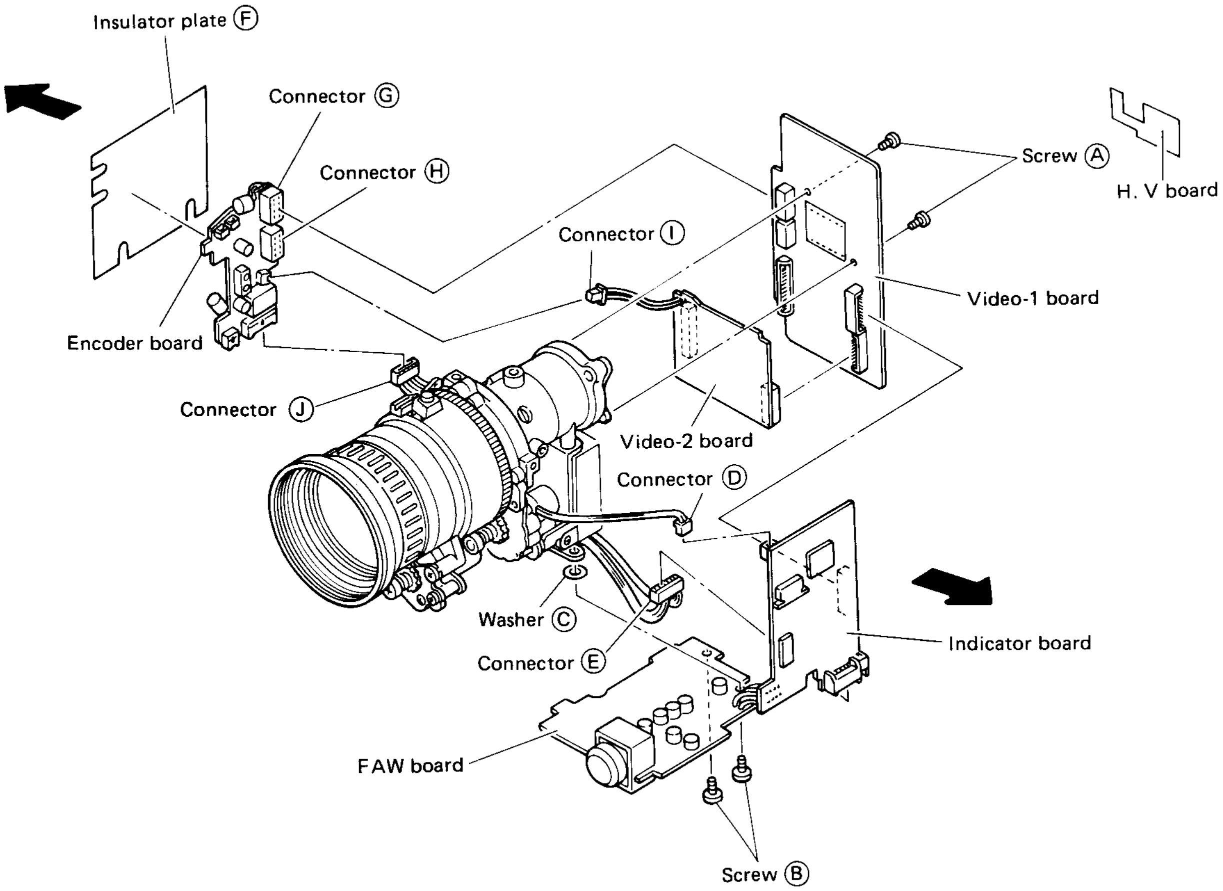

Insulator plate Ⓕ
Connector Ⓖ
Connector Ⓗ
Connector Ⓘ
Screw Ⓐ
H. V board
Video-1 board
Encoder board
Connector Ⓙ
Video-2 board
Connector Ⓓ
Indicator board
Washer Ⓒ
Connector Ⓔ
FAW board
Screw Ⓑ

Fig. 1-2-2

1.3 REPLACEMENT OF IMAGE SENSOR

1.3.1 Precautions

1. When replacing the CCD image sensor, make sure to grounding it by soldering and so on since its characteristic against electrostatic breakdown is weaker than C-MOS LSIs.
2. Pay enough attention to the transparent glass and optical filter of the CCD image sensor so that it won't be dusty, soiled or damaged. If it is soiled with fingerprints, etc., clean gently with silicon lens tissue, chamois, etc.
3. An orange protector seal was applied to the transparent glass of CCD image sensors before shipment. When replacing, do not remove it just before assembling it to the optical block.
4. When soldering the CCD image sensor to the board, do it as fast as possible. If it takes a considerable long time, it causes discoloration of the optical filter by excessive heat.

1.3.2 Removal of CCD image sensor

1. Remove two screws Ⓑ fixing the VIDEO-1 board and the CCD image sensor and unsolder the latter first, and then draw out the CCD image sensor in the direction of the arrow mark to separate it from the VIDEO-1 board.
2. Remove three screws securing the filter holder Ⓒ, and remove the optical LPF Ⓓ and the rubber Ⓔ for the removal.

1.3.3 Installation of CCD image sensor

1. Remove the protector seal of a CCD image sensor Ⓖ and set it on the imager holder Ⓕ first, and then, assemble the space rubber Ⓔ, optical filter Ⓓ, and the filter holder Ⓗ in the above order as piling up them. At this stage, make sure not to missetting the CCD image sensor and imager holder in wrong direction. The optical filter Ⓓ should be placed with its white marking facing downwards and to the lens section. After that, fix the filter holder to the imager holder Ⓕ with three screws Ⓒ.
2. Paying attention to the direction, fix the imager holder Ⓕ to the optical block with two screws Ⓕ.
3. Carefully insert the CCD image sensor's pins which protrude from the imager holder Ⓕ into the jacks of the VIDEO-1 board, and then secure the board with two screws Ⓑ.
4. Solder the pins of the CCD image sensor to the VIDEO-1 board. At this time, use care to avoid overheating.
5. Set the lens to MACRO. Confirm absence of vignetting at the image corners. If absent, the picture angle and centering are acceptable.

1.3.4 Adjustment

1. For correcting picture's center and diagonal image, loosen two screws Ⓑ of the VIDEO-1 board and move the whole of the board back and forth.
2. Perform back focus adjustment.
3. Electrical adjustment is not necessary.

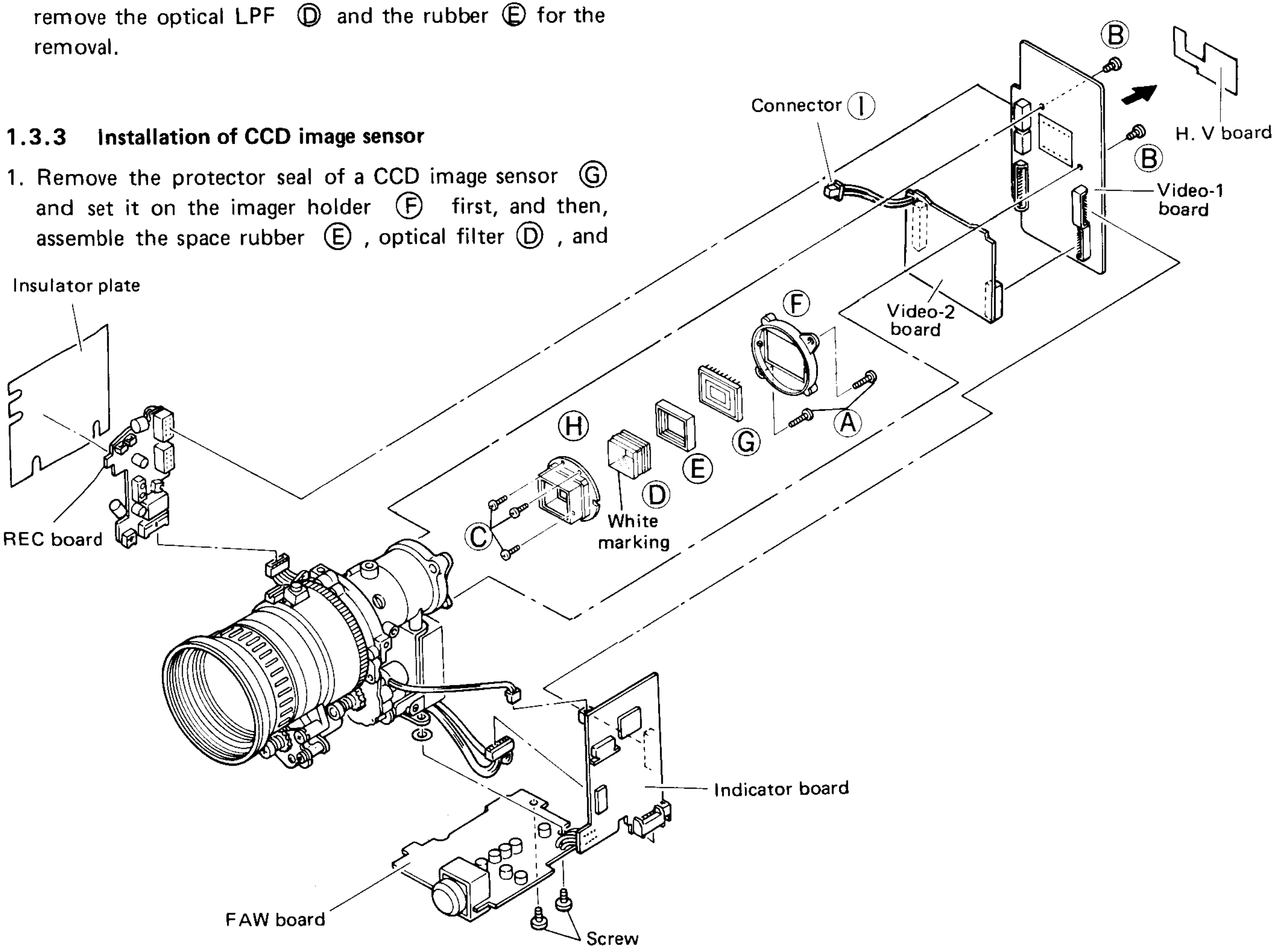


Fig. 1-3-1

1.3.5 Replacement of AF unit

- **Removal procedure**

1. Separate the camera section from the deck section, and remove the two screws Ⓐ.
2. Unsolder IC1 (CCD) on the VIDEO-1 board.
3. Draw out the INDICATOR board and ENCODER board which are directly connected to the VIDEO-1 board in the direction of arrow marks respectively.
4. The camera and deck sections can be separated by drawing out the VIDEO-1 board from the CCD in the direction of the arrow shown in Fig. 1-3-2.
5. The DC-DC converter can be removed by removing the two screws Ⓑ securing the converter (see Fig. 1-3-3).
6. Remove the two screws Ⓒ and one screw Ⓓ securing the AF (auto focus) unit to remove it from the camera section.
   Note: At removal of the screw Ⓓ, make sure not to miss a washer between the AF unit and the camera section.
7. Disconnect the 2-pin and 6-pin connectors of the AF unit to separate it from the camera section.
8. When fitting the camera section with a new AF unit, first set the interlocking pin of the AF unit into the grooved rail on the focus ring and then tighten the two screws Ⓒ in front of the AF unit (see Fig. 1-3-3).

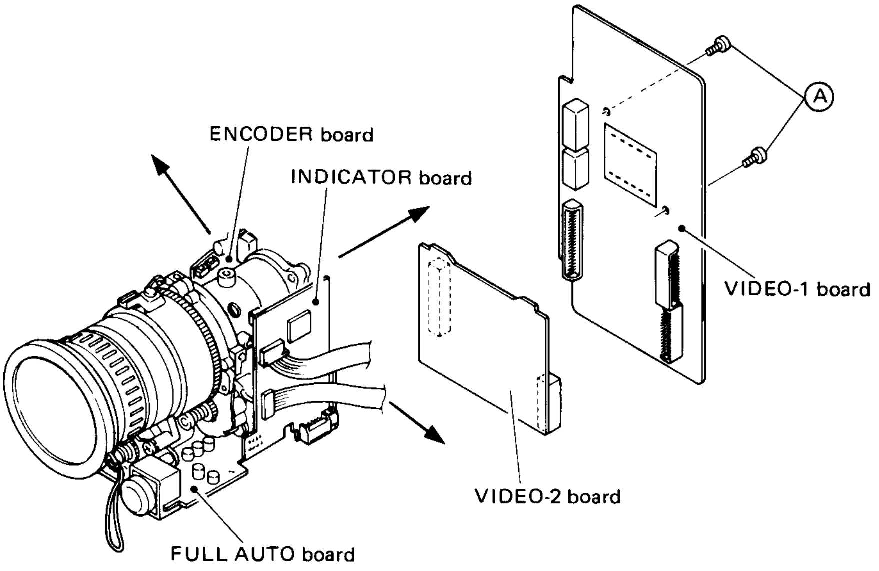

ENCODER board
INDICATOR board
Ⓐ
VIDEO-1 board
VIDEO-2 board
FULL AUTO board

Fig. 1-3-2

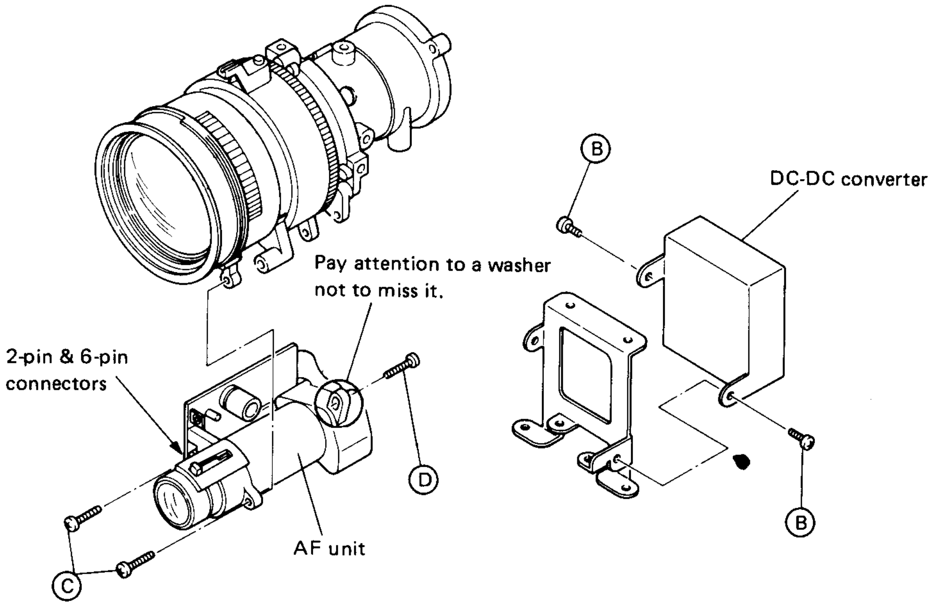

Ⓑ
DC-DC converter
Pay attention to a washer not to miss it.
2-pin & 6-pin connectors
Ⓓ
Ⓑ
AF unit
Ⓒ

Fig. 1-3-3

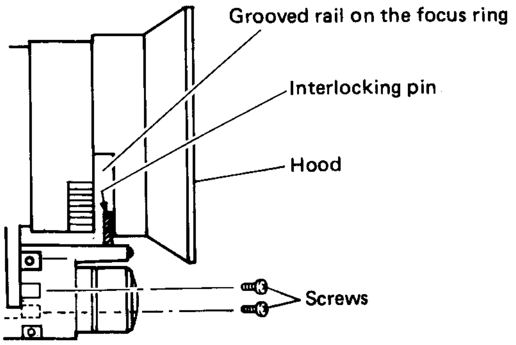
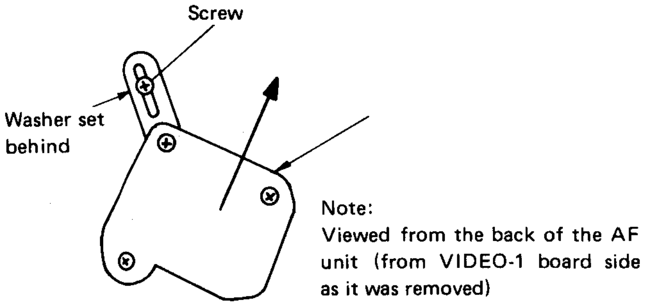

Grooved rail on the focus ring
Interlocking pin
Hood
Screws

Fig. 1-3-4

9. Secure the AF unit with a screw Ⓓ (Fig. 1-3-3) from the back. At this time, make sure to set a washer between the optical block and the AF unit, and Ⓓ, holding the AF unit in the direction of the arrow mark tighten the screw locating it around the center of the AF unit's slider plate.


Screw
Washer set behind

Note:
Viewed from the back of the AF unit (from VIDEO-1 board side as it was removed)

Fig. 1-3-5

10. After replacement, perform adjustments to be described below.

- **Adjustments**

Precautions

- After replacement of the AF unit, the following adjustment must be performed.
- Put away everything except the subject (especially clear around the optical section) since it is very delicate to adjust positioning of the AF unit.
- Before commencing the adjustment, confirm that back focus of the image pickup system has been correctly adjusted.

1. Set up a subject approx. 2 m distant from the lens.
2. Since the master lens for auto focus is located just under the image pickup lens, place the unit upside down so that the FULL AUTO board is positioned up.
3. Connect the CN6 of 02 Y/C board with the viewfinder and observe picture on the viewfinder screen.
4. Connect the CN410 of 24 INDICATOR board with the viewfinder, and confirm that indication patterns can be seen in the viewfinder.
5. Set the FOCUS switch to "AUTO" position, and turn the focus ring from 1.1 m to 5 m and vice versa repeatedly to check that picture is automatically in focus.

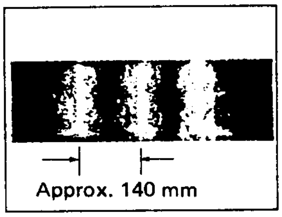

Approx. 140 mm

Fig. 1-3-7 AF adjustment chart

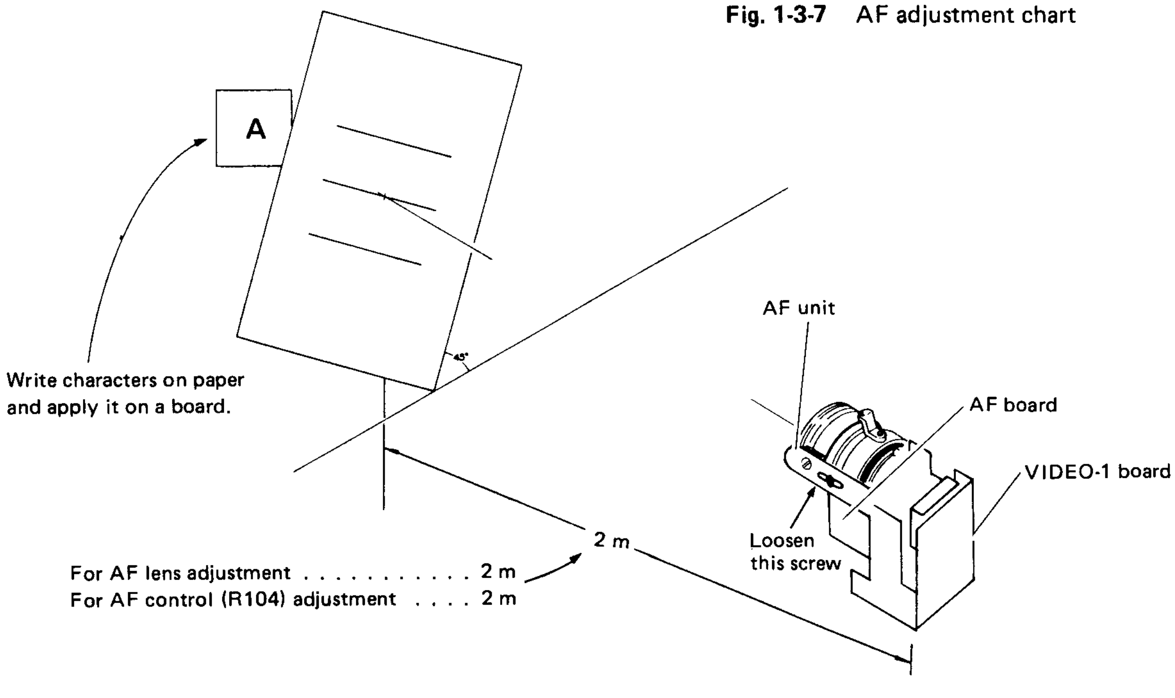

A
45°
Write characters on paper and apply it on a board.
2 m
For AF lens adjustment . . . . 2 m
For AF control (R104) adjustment . . . . 2 m
AF unit
AF board
VIDEO-1 board
Loosen this screw

Fig. 1-3-6 Setup for AF adjustment

6. Set the FOCUS switch to "MANUAL" position and attach the ND filter(s) which is used for back focus adjustment of the image pickup system to the lens.
7. In the above condition, confirm that the focus indication patterns ('focus in front', 'in focus', 'focus behind') are displayed in the viewfinder.

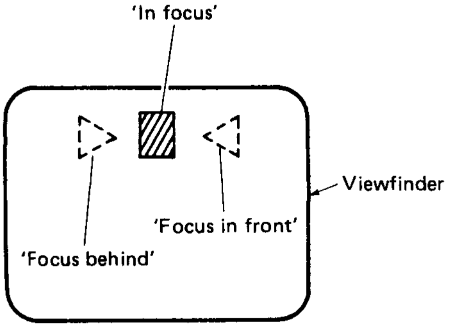

'In focus'
Viewfinder
'Focus in front'
'Focus behind'

Fig. 1-3-8

8. Observing the AF indication pattern in the viewfinder, adjust the master lens of the AF lens with an eccentric handle so that the lens brings the subject into focus – the indication pattern to show 'in focus' is located in the center of the viewfinder display.

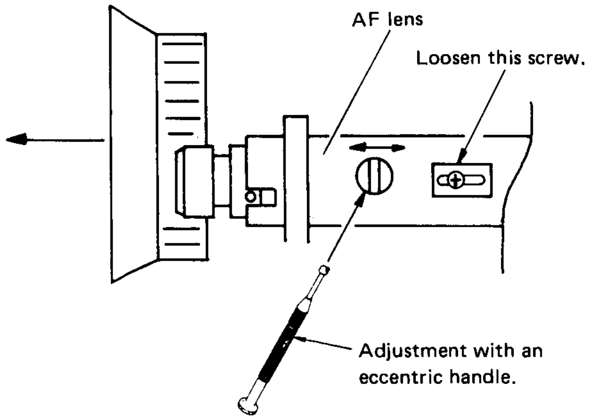

AF lens
Loosen this screw.
Adjustment with an eccentric handle.

Fig. 1-3-9

9. If the adjustment with an eccentric handle cannot be achieved, adjust VR104 so that the 'in focus' pattern is positioned in the center of the display.

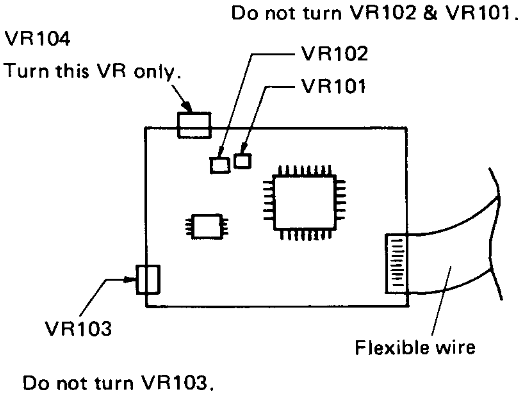

Do not turn VR102 & VR101.
VR104
Turn this VR only.
VR102
VR101
VR103
Flexible wire
Do not turn VR103.

Fig. 1-3-10

10. After the above adjustment is completed, set the FOCUS switch to "AUTO" and confirm that picture is in focus.

1.4 LOCATION OF MAIN BOARDS

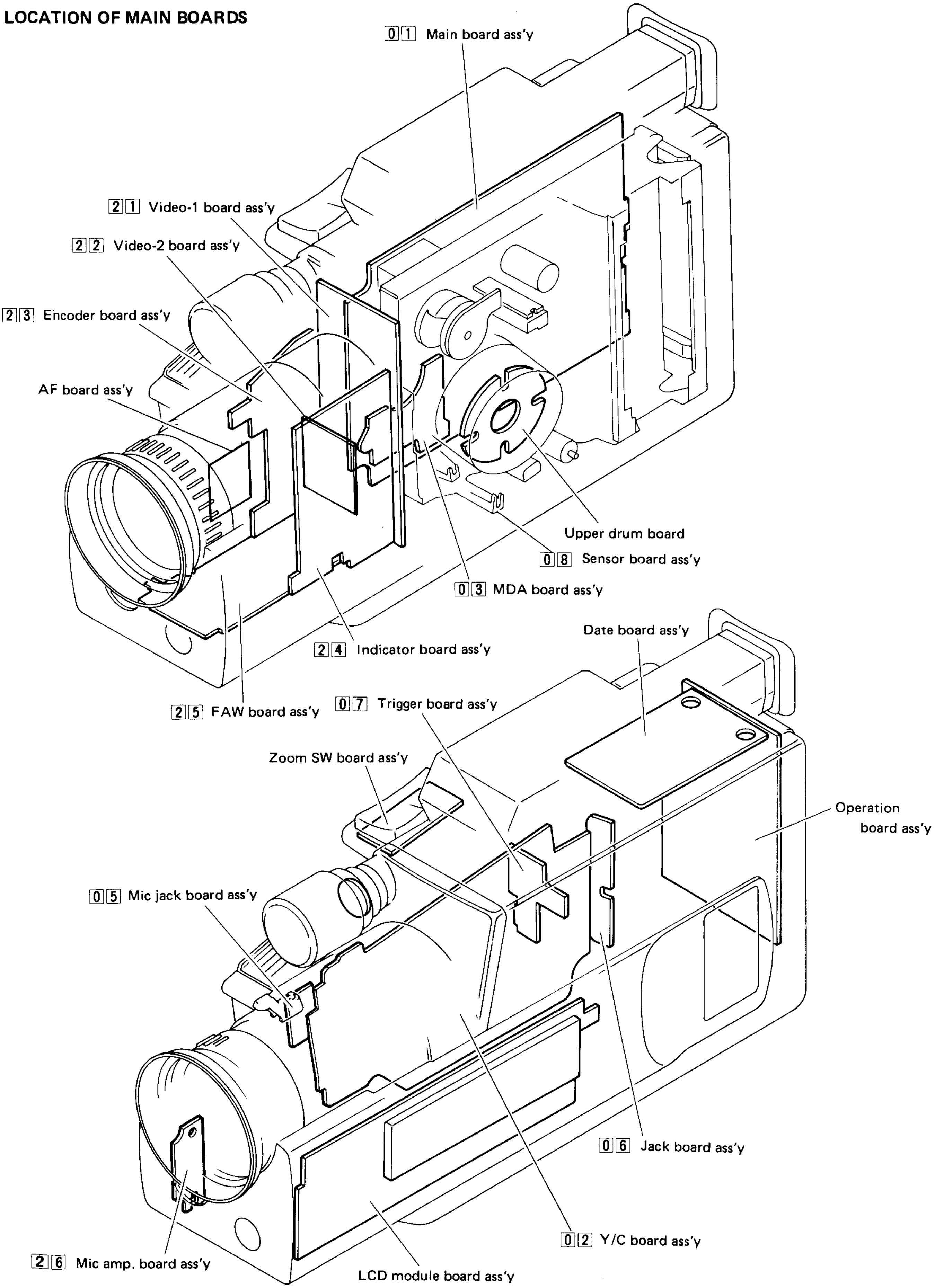

01 Main board ass'y
21 Video-1 board ass'y
22 Video-2 board ass'y
23 Encoder board ass'y
AF board ass'y
Upper drum board
08 Sensor board ass'y
03 MDA board ass'y
24 Indicator board ass'y
25 FAW board ass'y
07 Trigger board ass'y
Date board ass'y
Zoom SW board ass'y
Operation board ass'y
05 Mic jack board ass'y
06 Jack board ass'y
02 Y/C board ass'y
26 Mic amp. board ass'y
LCD module board ass'y

Fig. 1-4-1

SECTION 2
MECHANICAL ADJUSTMENT

2.1 BEFORE PROCEEDING

1. This section describes procedures to replace mechanism parts which have aged and been worn as well as for parts replacement resulting from accidental troubles.
2. As most mechanical adjustments have close relation to electrical adjustments, pay enough attention to adjusting the mechanism in consideration of that it is the base of electrical adjustments.
3. If it needs to operate the mechanism without a cassette loaded, apply black tape to the end sensor of the deck section to shut off light and turn on the cassette switch. In this condition, keep the reel disk rotating not to enter the mechanism into unloading mode.

2.2 REQUIRED JIGS AND TEST EQUIPMENT

1. To perform mechanical adjustment properly and easily, the following jigs and equipment are required for the exclusive use.
2. Besides the jigs and equipment for the exclusive use, the following measuring devices and general-purpose tools, etc. are necessary.
   - Color TV monitor
   - Hex. wrenches
   - Oscilloscope (wide band)
   - Precision screwdrivers
   - Cassette tape (for tape running test and recording)

Note: Tools and equipment for electrical adjustments, refer to the section 3.1.3.

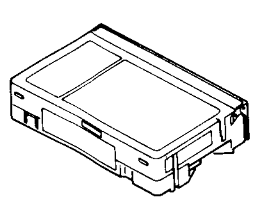
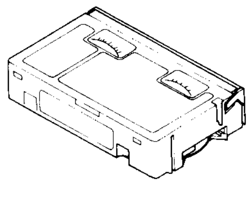
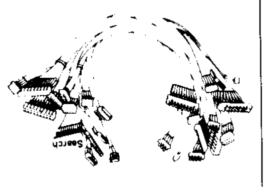
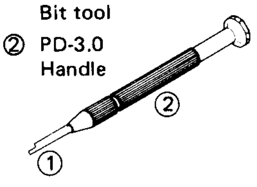
Alignment tape (for SP) MH-C2	Cassette torque meter PUJ50431-2	Patching cord YTU93001C	A/CTL head position tool ass'y YTU93002A
			① YTU93002-01 Bit tool ② PD-3.0 Handle 

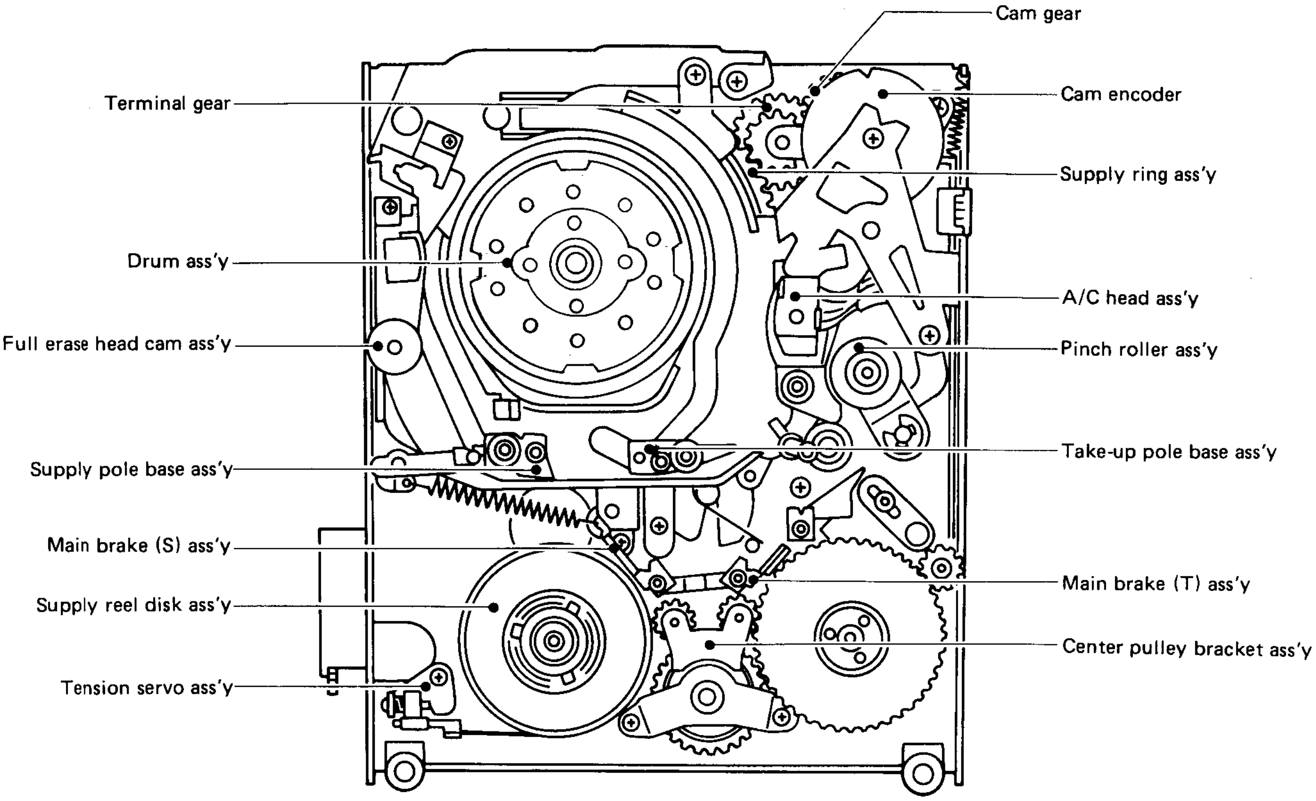
Table 2-2-1 Tools and equipment for mechanism adjustment

■ **GR-45EG**
Mode shift

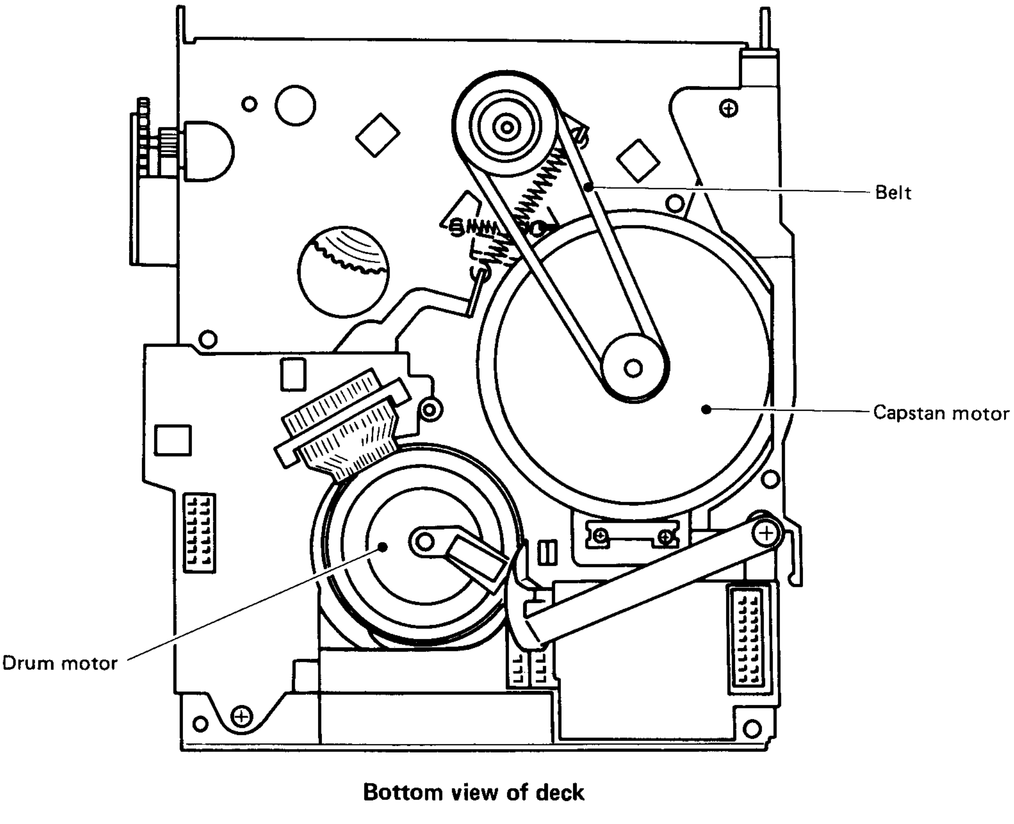
REW		FF		PAUSE — REC				REC					SEARCH		EDIT	STILL	UNLOAD	UNLOAD	LOAD	PLAY	REHEARSAL	STOP	REC SAFE SW OPEN	CASSETTE SW OPEN	DEW.S ON	EMERGENCY	POWER OFF	Mode / SW
				QUICK REV	BACK SPACE	w/ Remocon CAM	w/o Remocon CAM	UNLOAD	LOAD	w/ Remocon CAM	w/o Remocon CAM		REW	FF														
○		○					○	○	○	○	○		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	POWER
○		○					○	X	○	○	○		○	○	○	○	○	X	○	○	○	X	○		○			STOP
X		○						○					Search ◕	○		Search ◕	End ○	○	Ind. ◕	Search ◕	○	○	○		○			REW
○		X						○						Search ◕		Search ◕	Start ○	○	Ind. ◕	Search ◕	○	○	○		○			FF
○		○						○								○	○	○	○	○	○	○						REC
○		○						○	EXT ○							○	○	○	X	X	○	○	○					PLAY
															○	○			Pause ○	Pause ○			○					PAUSE
							○		CAM ○		○										Remote ○							C.TRIGGER
							X		Remocon ○	○	X																	Remocon
								○									○	○			○	○	○		○			EJECT
						○	○									Preroll ○					Edit ○		Edit ○					QUICK REV / EDIT
						○	○	○	○	○	○		Auto	Auto	Auto		○	○		Auto	○	○	○		○			SP/LP
																					X	○	○		○			REHARSAL
○		○													○													Counter memory
5																												

○ : Mode shift operative X : No change in mode : No change in mode ◕ : Effective during SW pressed

2.3 LOCATION OF MAIN PARTS


Cam gear
Terminal gear
Cam encoder
Supply ring ass'y
Drum ass'y
A/C head ass'y
Full erase head cam ass'y
Pinch roller ass'y
Take-up pole base ass'y
Supply pole base ass'y
Main brake (S) ass'y
Main brake (T) ass'y
Supply reel disk ass'y
Center pulley bracket ass'y
Tension servo ass'y

Top view of deck


Belt
Capstan motor
Drum motor

Bottom view of deck

2.4 REPLACEMENT OF UPPER DRUM

1. Unsolder all soldered points of 10 relay pins on the relay board (see Fig. 2-4-1).

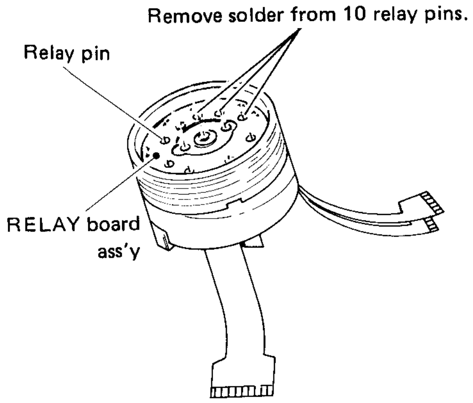

Remove solder from 10 relay pins.
Relay pin
RELAY board ass'y

Fig. 2-4-1 Upper drum assembly

2. Remove two screws from the upper drum.
3. To remove the upper drum, fit it out with a jig provided with a new upper drum and secure them to each other by tightening a screw provided with the jig and the two screws removed once from the drum as shown in Fig. 2-4-2(A).

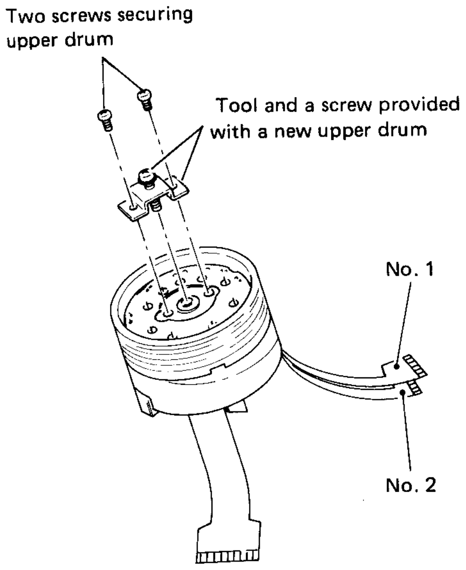

Two screws securing upper drum
Tool and a screw provided with a new upper drum
No. 1
No. 2

Fig. 2-4-2(A) Upper drum ass'y and replacing tool

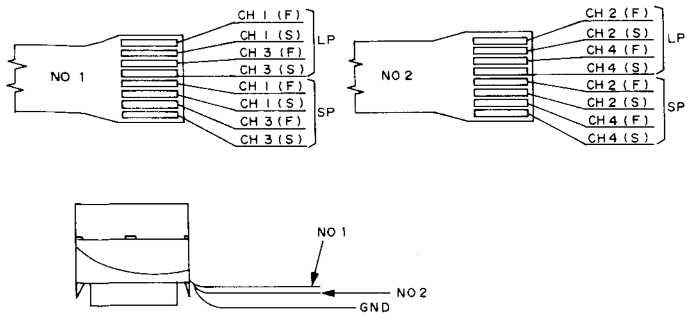

NO 1
CH 1 (F)
CH 1 (S)
CH 3 (F)
CH 3 (S)
LP
CH 1 (F)
CH 1 (S)
CH 3 (F)
CH 3 (S)
SP
NO 2
CH 2 (F)
CH 2 (S)
CH 4 (F)
CH 4 (S)
LP
CH 2 (F)
CH 2 (S)
CH 4 (F)
CH 4 (S)
SP
NO 1
NO 2
GND

Fig. 2-4-2(B) Upper drum ass'y and replacing jig

4. Before installing a new upper drum, insert a soldering iron (50 W) into the hole of the upper drum and heat it for 3–5 minutes to expand the upper drum. (See Fig. 2-4-3.)

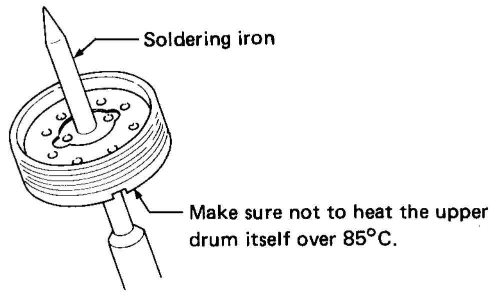

Soldering iron
Make sure not to heat the upper drum itself over 85°C.

Fig. 2-4-3 Upper drum

5. When fitting the lower drum with a new upper drum being expanded, set the lower drum as its three holes are in the form of inverse triangle as shown in Fig. 2-4-4.

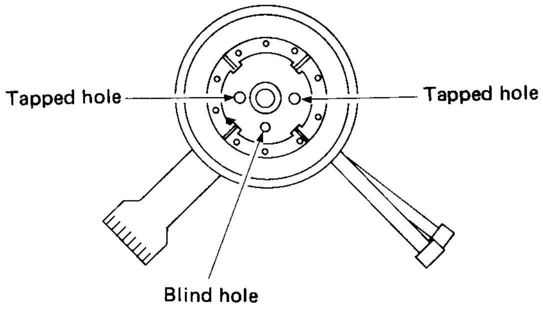

Tapped hole
Tapped hole
Blind hole

Fig. 2-4-4 Lower drum

6. Recognizing the upper drum head, fix the upper drum to the lower drum as the head pins' red wires make a right angle with the lower drum's blind hole.

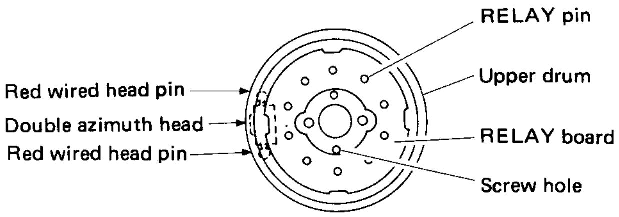

RELAY pin
Upper drum
Red wired head pin
Double azimuth head
Red wired head pin
RELAY board
Screw hole

Fig. 2-4-5 Upper drum assembly

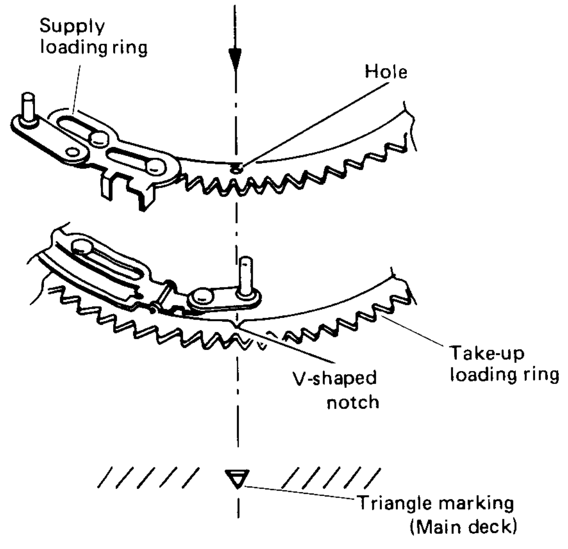
2.5 CHECK AND ADJUSTMENT

Before replacing or removing the following parts, make sure to confirm their positions particularly in relation to others for a reference of re-assembling.

2.5.1 Phase adjustment of cam gears and loading rings

When removing or replacing take-up and supply loading rings, make sure to set the loading ring's position for the Stop mode beforehand (see Fig. 2-5-1).

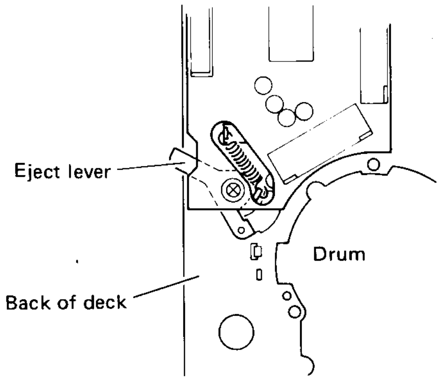
1. Remove the worm gear (inside the loading motor bracket assembly) in advance, turn the take-up/supply loading ring in the unloading direction.
2. Adjust positions of the take-up and supply loading rings so that their hole and V-shaped notch are located in a straight line to the triangle mark of the main deck (viewed from the top, see Fig. 2-5-1 [a]).



Supply loading ring
Hole
Take-up loading ring
V-shaped notch
Triangle marking (Main deck)

Fig. 2-5-1 (a) Phase adjustment of loading rings

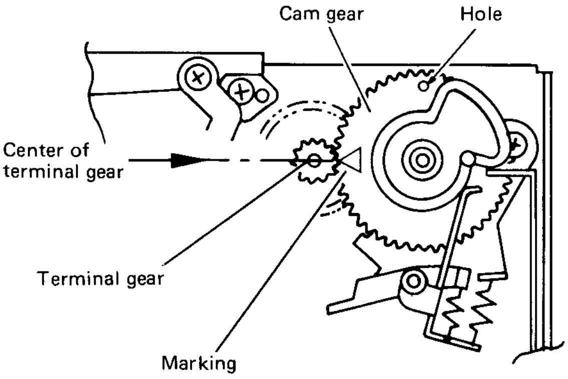
During phase adjustment of the loading ring, keep the eject lever located on the rear of the deck depressed downward (in the direction of the reel). See Fig. 2-5-1 (b). If the eject lever is off the above-mentioned position, it does not work for ejection.



Eject lever
Drum
Back of deck

Fig. 2-5-1 (b) Phase adjustment of eject lever

3. As stated in the above item 2, two loading rings should be correctly positioned before re-assembly. In regard with this work, it is recommended to attach one of three ring guides (the nearest one to the take-up side or to the A/C head) to the two loading rings to make the work easy.
4. To enter the mechanism into the Stop mode, position the control cam gear's marking and the center of the terminal gear's axis as shown in Fig. 2-5-2.

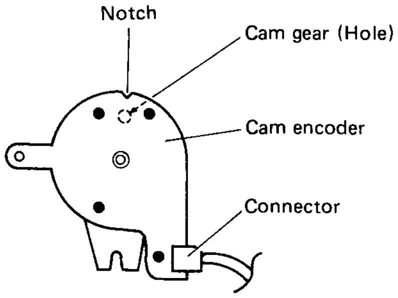


Cam gear
Hole
Center of terminal gear
Terminal gear
Marking

Fig. 2-5-2 Phase adjustment of control cam

2.5.2 Mode control switch

1. In the Stop mode, the mode control switch is set in the phase shown in Fig. 2-5-3.



Notch
Cam gear (Hole)
Cam encoder
Connector

Fig. 2-5-3 Phase adjustment of mode control switch

2.5.3 Middle pole

1. In the Stop mode, relative position of the middle pole and the arm gear is as shown in Fig. 2-5-4.

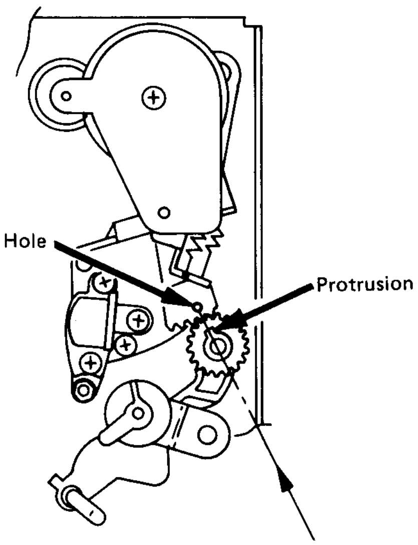


Fig. 2-5-4 Phase adjustment of middle pole

2.5.4 Checkup of tension pole position and back tension adjustment

Load the mechanism with a cassette and set it for the playback mode. Then, confirm that centers of the tension pole assembly and the impedance roller are in a straight line to the front of the deck (in the direction of the cassette housing). See Fig. 2-5-5.

Note: Torque can be adjusted by turning the torque adjustment screw 1 (Fig. 2-5-5), namely, torque increases by turning it clockwise while decreases by counterclockwise turning.

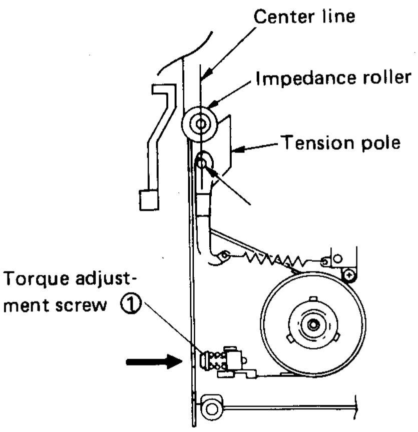


Fig. 2-5-5 Phase adjustment of tension pole

2.6 CHECK AND ADJUSTMENT OF TAPE TRANSPORT SYSTEM

Note: Generally, the tape transport system does not require any adjustment since it has been precisely adjusted at the factory.
However, this adjustment is needed when parts of the tape transport system were replaced as a result of a long-time use or any trouble in the system.

2.6.1 Guide rollers

1. Guide roller height adjustment is required in order to attain FM waveform linearity at the drum input and output sides in the procedure of the interchangeability adjustment.
2. With a cassette tape (except alignment tapes) running, adjust the height of the supply guide roller with a hex. wrench (1.4 mm) so that the tape runs smoothly along the drum lead at the drum entrance side.
3. For the drum exit side, adjust the take-up guide roller height in the same manner as above.

2.6.2 Impedance roller

Note: In principle, any adjustment of the impedance roller should not be done since the impedance roller has the reference height of the supply side and the nut securing it is not for adjustment but just for fixing.

1. For a reference, relative position between the main deck and the impedance roller is shown in Fig. 2-6-1.
This is a reference height of the supply side (for the tape entrance, etc.).

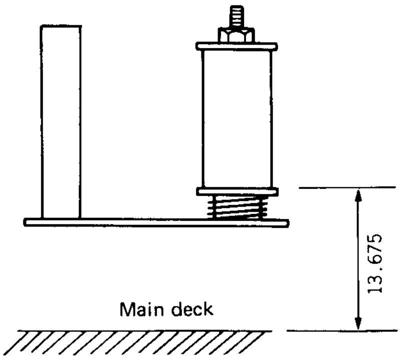


Fig. 2-6-1 Impedance roller height

2.6.3 Audio/control (A/CTL) head
(located by the take-up guide pole)

Note: Adjustment of audio/control head is given much weight in the interchangeability adjustment.

1. After completion of the take-up guide roller adjustment, adjust the A/CTL head's inclination so that the tape runs smoothly along the flange of the take-up guide pole. This adjustment can be performed by turning the screw ② with a precision screwdriver (cross-head,⊕). See Fig. 2-6-2.
2. By way of an example of the adjustment, turn the screw 2 counterclockwise to wrinkle the running tape around the bottom of the take-up guide pole, and then slowly turn the screw clockwise until no wrinkles are not found in the tape.
3. Next, proceed to adjustments of its azimuth and height.

Note: There is no place for adjustment of the take-up guide pole since it has been precisely adjusted as a reference height of the take-up side (tape outlet side).

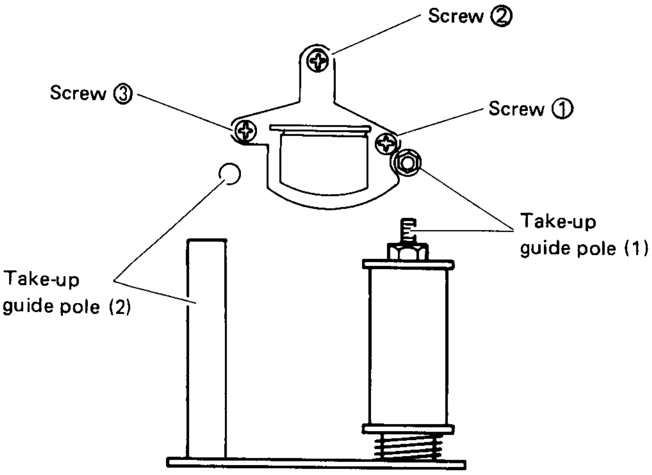


Fig. 2-6-2 A/CTL head adjustment

2.7 CHECK AND ADJUSTMENT OF INTERCHANGEABILITY

Note: Before using an expensive alignment tape for the interchangeability adjustment, it is recommended to use an ordinary cassette tape to check up no trouble in tape running. If there is any trouble in the tape running, find the cause and remedy it first.

2.7.1 FM waveform

For checking and adjusting FM waveforms, use the alignment tape MH-C2 and stairstep signals.

1. Play back the alignment tape MH-C2 and adjust the tracking control to obtain the maximum FM waveform. At this time, confirm that the waveform is the standard video FM waveform as shown in Fig. 2-7-1, namely, [a] (maximum output), [b] (minimum output at the center of waveform), [c] (minimum output at the drum intake – input portion), and [d] (minimum output at the drum outlet – output portion) are in the relationship shown below.

$\frac{b}{a} \geq 0.8$ $\frac{c}{a} \geq 0.7$ $\frac{d}{a} \geq 0.7$

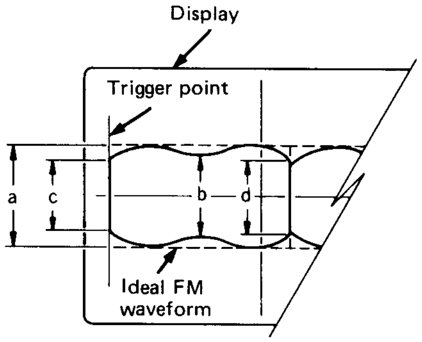


Fig. 2-7-1 FM waveform (standard video FM waveform)

2. If the waveform does not satisfy the standard conditions or it is far from linear (parallel) variation, re-adjustment is needed. If the waveform is far from the parallel shape, it causes a partial level drop owing to a slight tracking error, which may result in noise occurrence.
3. Turn the tracking control to vary the FM waveform from maximum to minimum, and vice versa, and confirm that the FM waveform varies rather parallel at the drum intake (input) side.
   If FM waveform irregularly changes, for example, expanded portion becomes narrow or narrowed portion expands, it is because of incorrect height of the supply guide roller (incorrect tape running along the drum lead at the drum intake). Such being the case, adjustment of the supply guide roller height is very important for correct and smooth tape running and to obtain satisfactory FM waveform variation of rather parallel lines. (See Fig. 2-7-2.)

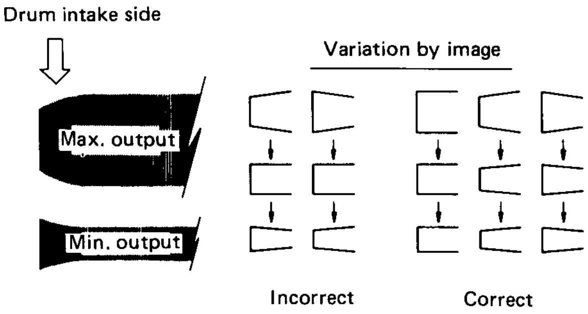


Fig. 2-7-2 FM waveform variation at drum intake

4. In the same manner as above, check up FM waveform variation between maximum and minimum outputs whether they are nearly in parallel lines or not. If not, adjust the take-up guide roller height (tape outlet side). See Fig. 2-7-3.
5. Next, perform fine adjustments of the take-up and supply guide roller heights for entire FM waveform variation between maximum and minimum outputs by the tracking control operation so that every variation shows parallel and linear lines.
6. After completion of the height adjustments for the take-up and supply guide rollers, confirm that there is no wrinkle nor damage in the tape around the impedance roller and take-up guide pole. If such the symptom is found around the supply impedance roller which functions as the lower limiter of the tape, fine adjust the roller's position slightly downwards. This adjustment must be done only for the supply impedance roller.
   On the other hand, if such the symptom is seen around the take-up guide pole, adjustment should be performed not for the take-up guide pole but for the A/CTL head by adjusting its inclination (for correct tape contact) to travel the tape correctly along the flange on the bottom of the guide pole.
   After confirmation of normal tape running, check up entire FM waveform again.

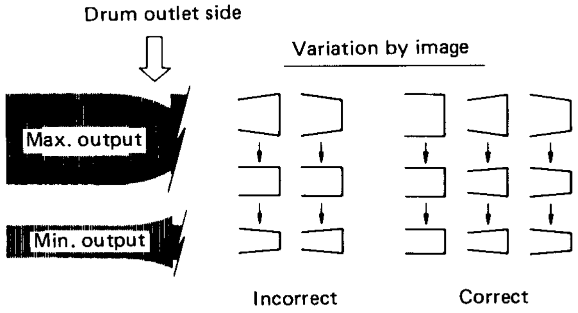


Fig. 2-7-3 FM waveform variation at drum outlet side

2.7.2 A/CTL (audio/control) head adjustment

Incorrect positioning of the A/CTL head causes reduced audio output when a tape is played back by another video deck, deterioration in S/N, and in a severe case, interference in servo stability due to inability to pick up control signals. To observe audio signals connect an oscilloscope to the audio output terminal.

1. Play back the stairstep segment (7 kHz audio signal) of the alignment tape MH-C2.
2. Adjust the A/CTL head height by turning screws Ⓐ, Ⓑ and Ⓒ precisely and evenly.

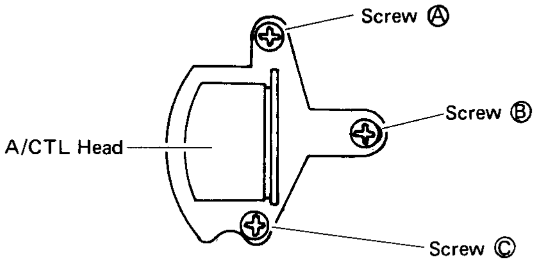


Fig. 2-7-4

3. Turn the screw Ⓐ to obtain the maximum audio output.
4. Turn the screws Ⓐ , Ⓒ and Ⓑ evenly little by little in the same direction to change height of the A/CTL head, and settle it for the maximum audio output.
   output.

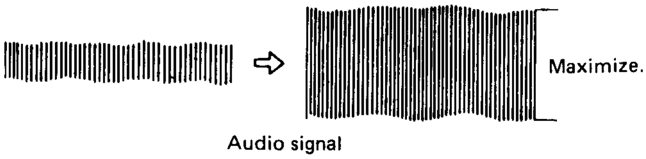


Fig. 2-7-5 A/CTL head adjustment

2.7.3 Control head phase (X value) adjustment

If the phase (X value) of the control head is coming off, it causes timelag between playback picture and voice. This symptom remarkably appears in the EP mode comparing with the standard mode.

For this adjustment, set the tracking control at the center detent (AUTO) position.

1. Connect an oscilloscope to TP109 (TP FM) of the MAIN board (SERVO) and observe the waveform.
2. Play back the stairstep signals of the alignment tape MH-C2.
3. Slightly loosen screws Ⓓ and Ⓔ of the A/CTL head and set the tip of the A/CTL head positioning jig in the groove and guide hole respectively. Then, pull the A/CTL head fully in the direction of the capstan. (See Fig. 2-7-6.)
4. Moving the A/CTL head in the reverse direction of the above step 2, observe variation of CH-2 FM waveform and stop moving the head at the first point where the output becomes maximum. Then, tighten the screws Ⓓ and Ⓔ.

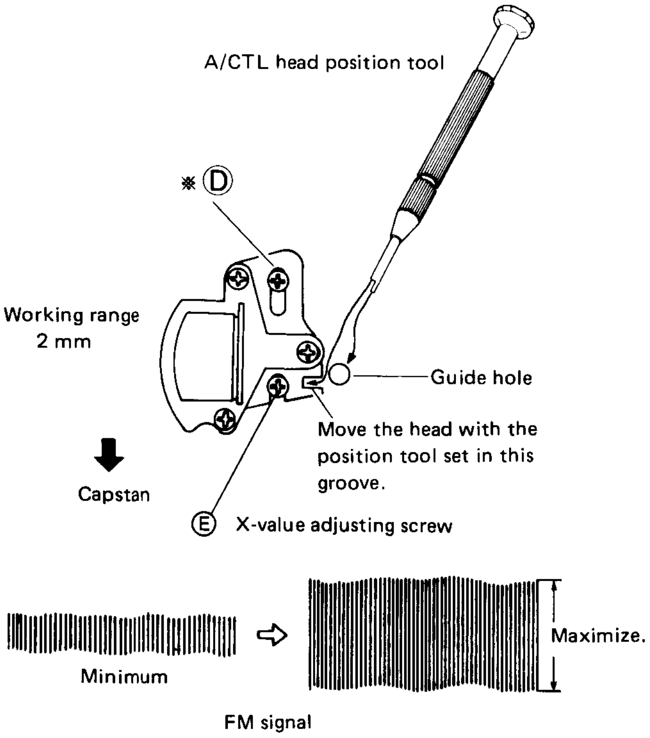

A/CTL head position tool
✻Ⓓ
Working range
2 mm
Capstan
Guide hole
Move the head with the position tool set in this groove.
Ⓔ X-value adjusting screw
Minimum
Maximize.
FM signal

Fig. 2-7-6 X-value adjustment

2.7.4 Final check

1. Confirm that the FM waveform recorded by the subject deck satisfies the standard of video FM waveform shown in Fig. 2-7-1. At the same time, also confirm that the switching point does not come off.

SECTION 3
ELECTRICAL ADJUSTMENTS

3.1 DECK SECTION

3.1.1 Precautions

Electrical adjustments are generally necessitated after replacing worn mechanical parts or video heads because of interrelationship between those parts and various electrical circuits.

In the event of malfunction with electrical circuits, troubleshooting with the aid of proper test instruments must be done first, and then, commence necessary repair, replacement, and adjustment, etc.

For adjustment of electrical circuits equipped with trimming resistors, replace those necessary for the adjustment with variable resistors only in the servicing period.

At field service without a complete range of test instruments, avoid unnecessary disturbance of the internal control settings. For satisfactory repair and adjustment, send back the unit to the factory or to the nearest authorized service center.

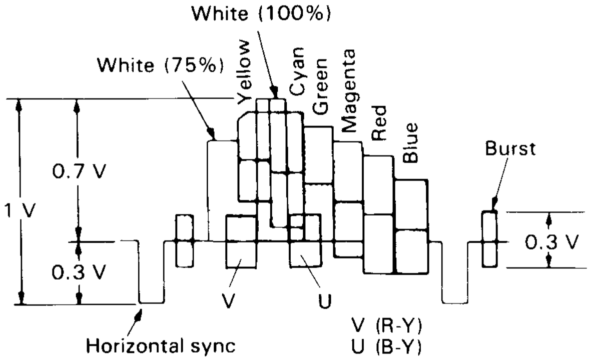
3.1.2 Adjustment procedures and terms used in this section

No. . . . . Order of adjustment and checkup
Item . . . . Name of adjustment and checkup
Check point . . . Point(s) to be connected with test instruments
Adjustment parts: Parts such as variable resistors, trimmer capacitors, etc. to be adjusted.
Mode & signal . External input signal and mode necessary for adjustment
- Color bars: Input color bars signal
- Stairstep: Input stairstep signal
- 1 kHz: Input 1 kHz audio signal
- MH-C2 color bars: Color bars signal of MH-C2 alignment tape to be played back
- MH-C2 stairstep: Stairstep signal of the same
- MH-C2 3 kHz: 3 kHz audio signal of the same
- MH-C2 1 kHz: 1 kHz audio signal of the same
- MH-C2 RF sweep: RF sweep signal of the same
- CH-C5L color bars: Color bars signal of CH-C5L alignment tape to be played back
- STOP: Stop mode with the power turned on
- REC: Recording mode
- PB: Playback mode
- REC → (other mode): Record on a blank tape which will be used in other mode(s)
- PAUSE/STILL: Still playback mode
- SHUTTLE SEARCH: Shuttle search (normal and reverse) playback mode
- DUBBING: dubbing mode
- EJECT: Ejection of loaded cassette

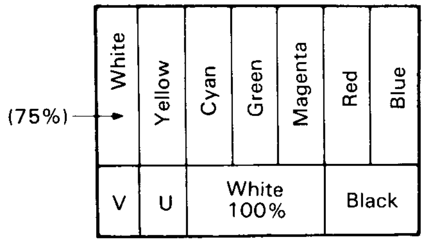
Description . . . Method of checkup and adjustment, waveform, notice, etc.

3.1.3 Required test equipment

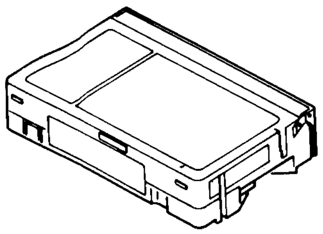
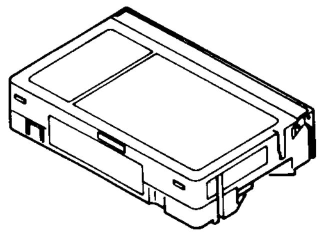
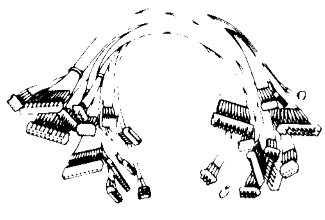
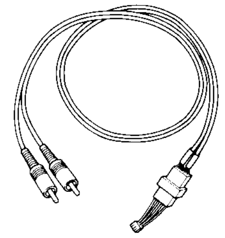
1. Color monitor TV
2. Oscilloscope
3. Video cassetter for checkup
4. Frequency counter
5. Audio tester
6. Regulated DC power supply
7. Digital voltmeter
8. Blank tape (EC-30) for recording and playback
9. Standard electrical service tools, etc.



Waveform of color bars signal



Color bars pattern

Alignment tape (MH-C2)	Check tape (LP mode) (CH-C5L)	Patch cord YTU93001C	Y/C separator tool YTU93006
			

3.1.4 External supply of video signals

• Connection of Y/C separator

See Fig. 3-1-1.

Connect the Y/C separator's DC OUT cable to DC IN of the GR-45EG/EK deck and supply 9.6 V DC to the separator's DC IN terminal from AA-V5EG/EK, etc.

Next, connect the red terminal of the attached cable to C OUT of the Y/C separator while the white terminal to Y OUT, and connect the cord of a signal (color bars) generator to VIDEO IN of the Y/C separator.

In the state that the signal generator is supplying color bars signal to every connected circuit, perform adjustments according to the adjustment procedures (for REGULATOR, SERVO, Y/C and AUDIO boards) herein described.

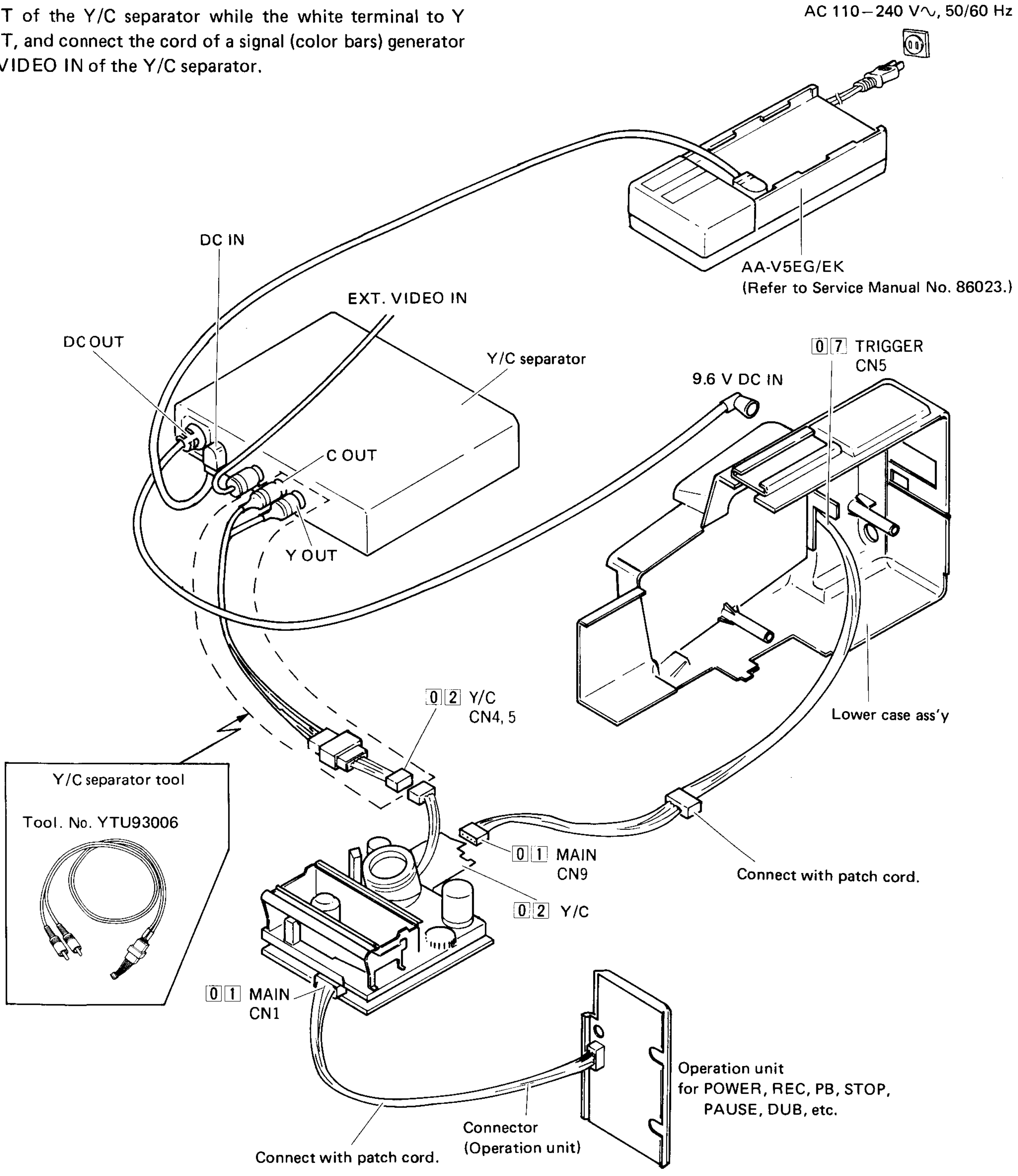
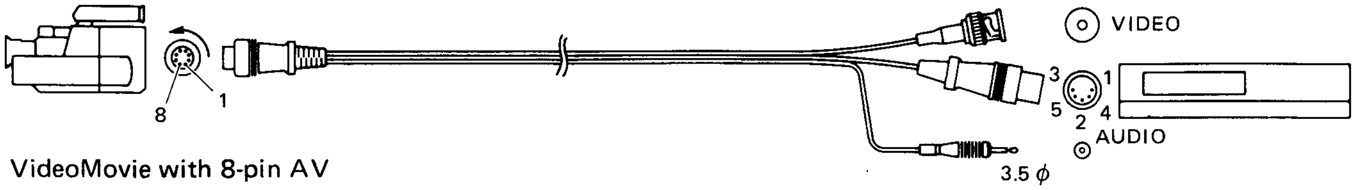

AC 110−240 V∿, 50/60 Hz
AA-V5EG/EK
(Refer to Service Manual No. 86023.)
DC IN
EXT. VIDEO IN
DC OUT
Y/C separator
C OUT
Y OUT
9.6 V DC IN
07 TRIGGER
CN5
Lower case ass'y
02 Y/C
CN4, 5
Y/C separator tool
Tool. No. YTU93006
01 MAIN
CN9
02 Y/C
Connect with patch cord.
01 MAIN
CN1
Operation unit
for POWER, REC, PB, STOP, PAUSE, DUB, etc.
Connector
(Operation unit)
Connect with patch cord.

Fig. 3-1-1

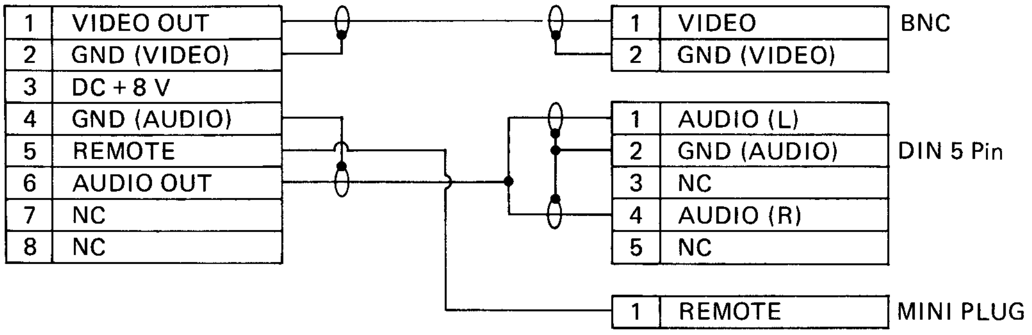
3.1.6 Appearance and connection of cables

- VC-V856E AV DUBBING CABLE (2.5 m)



VideoMovie with 8-pin AV output connector

VCR with BNC connector and 5-pin DIN Connector



8-pin DIN Connector

1	VIDEO OUT
2	GND (VIDEO)
3	DC + 8 V
4	GND (AUDIO)
5	REMOTE
6	AUDIO OUT
7	NC
8	NC

BNC

1	VIDEO
2	GND (VIDEO)

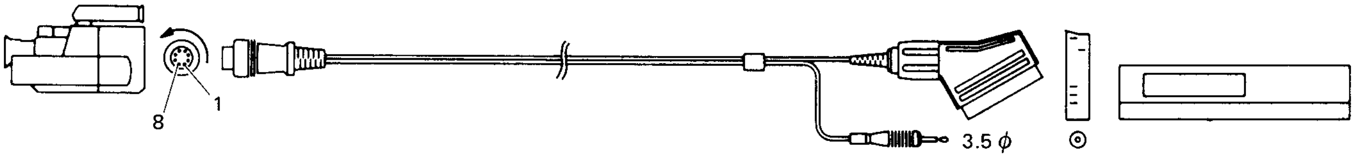
DIN 5 Pin

1	AUDIO (L)
2	GND (AUDIO)
3	NC
4	AUDIO (R)
5	NC

MINI PLUG

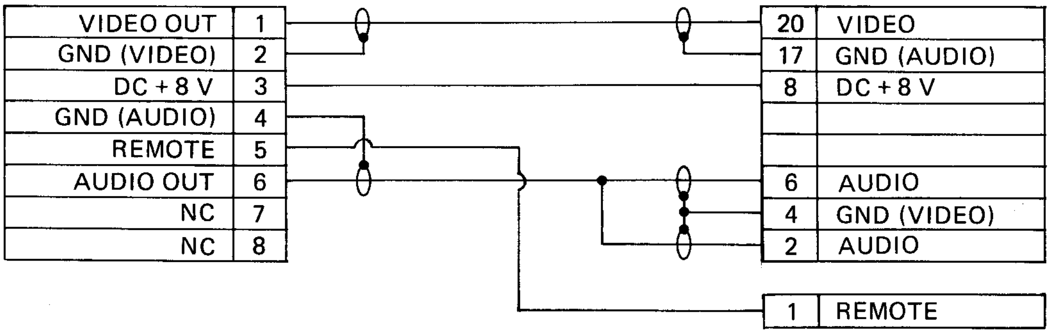
1	REMOTE

- VC-V896E AV DUBBING CABLE (2.5 m)



VideoMovie with 8-pin AV output connector

VCR with AV input socket (21-pin Peri connector)



8-pin DIN Connector

VIDEO OUT	1
GND (VIDEO)	2
DC + 8 V	3
GND (AUDIO)	4
REMOTE	5
AUDIO OUT	6
NC	7
NC	8

21-pin Peri connector

20	VIDEO
17	GND (AUDIO)
8	DC + 8 V
6	AUDIO
4	GND (VIDEO)
2	AUDIO

1	REMOTE

3.5φ Mine plug

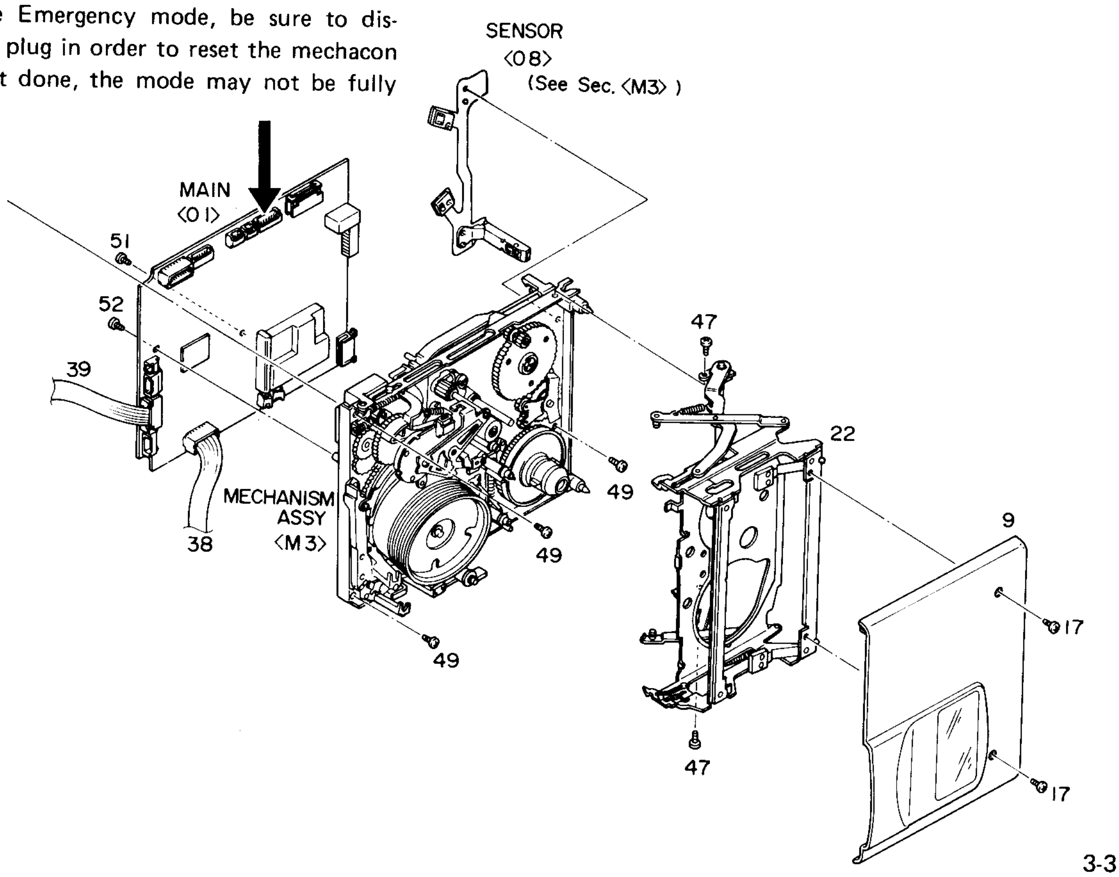
3.1.5 Emergency mode

1. Emergency mode table

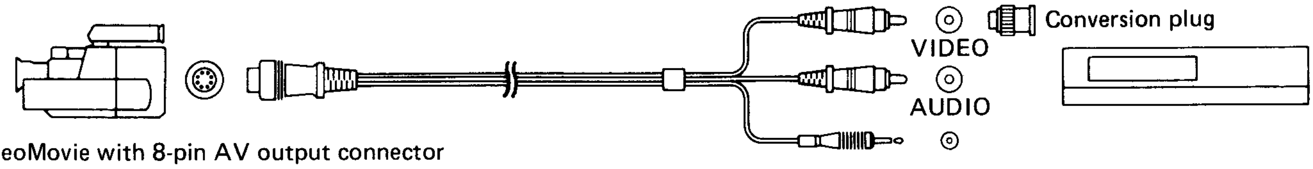
No.	DISPLAY FRASH	CONTAINS	OBSERVE MODE	SHIFTED MODE
0	▶▶	PB CTL pulse input absent	During Zero Frame Editing	STOP
1	◀◀			
2	▶ ▶▶	Drum flipflop input absent	Drum rotates, Zero Frame Editing	STOP
3	▶ ◀◀	Reel sensor input absent	PB, REC, S FF	STOP
4	❚❚	REG 5 V level abnormal	All modes	MAINTENANCE
5	▶ ❚❚	Loading motor rotates for more than 10 seconds without shift to next mode.	LOADING, UNLOADING	
6	—	Emergency input (H) at EMG pin	All modes	Power OFF

Emergency mode : Indication for 5 minutes, then power OFF (power not turned OFF when using AC adapter)
Port states : Same as Stop mode
Effective key : POWER
Shifted mode : Power OFF
No. 6 : Emergency shut off can be used for short test, etc.
Emergency input is "H" and EMG terminal.
Power OFF in all modes and all I/O are initialized.

2. To release the Emergency mode to perform repair, short pins 2 (TEST 1) and 3 (TEST 2) of the MAIN board CN-15 (indicated by arrow A in figure) to pin 1 (GND). This will release the Emergency mode.
   When releasing the Emergency mode, be sure to disconnect the power plug in order to reset the mechacon CPU. If this is not done, the mode may not be fully released.



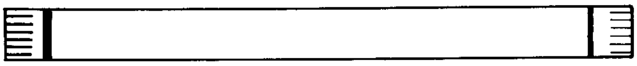
- VC-V826E AV OUTPUT CABLE (2.5 m)


Conversion plug
VIDEO
AUDIO

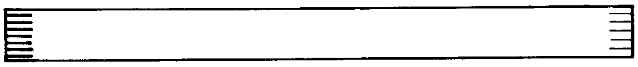
VideoMovie with 8-pin AV output connector

VCR or TV/monitor with RCA (or BNC) AV input connectors

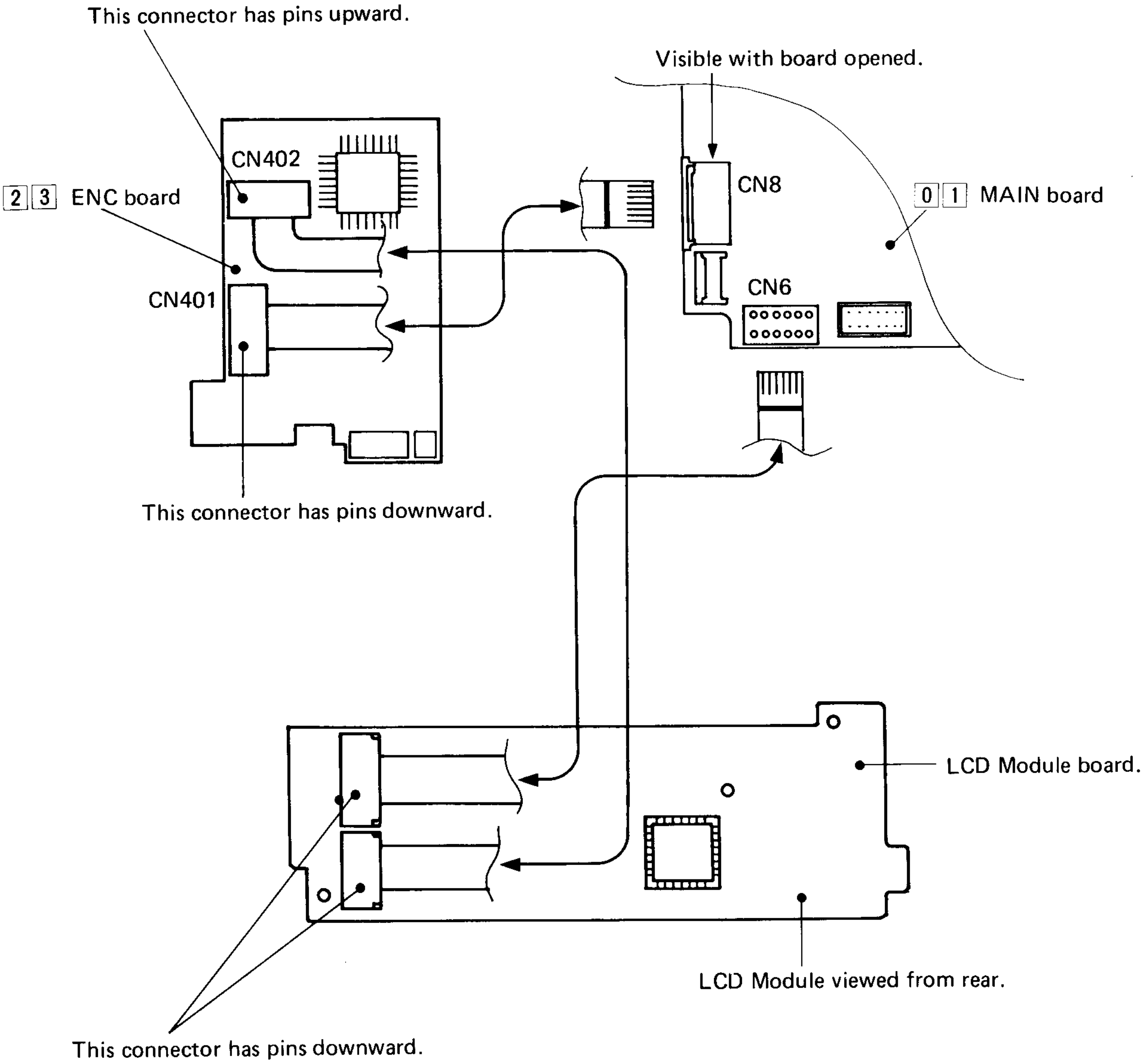
- By engaging the flat cableconnector of the YTU93001C patch cord, since the electrical polarity becomes reversed, be sure to perform as follows.



Blue marked side is front.



Unmarked side is conductor. When inserting connector, perform in this manner.


CN402
2 3 ENC board
CN401
CN8
CN6
0 1 MAIN board

This connector has pins upward.

Visible with board opened.

This connector has pins downward.

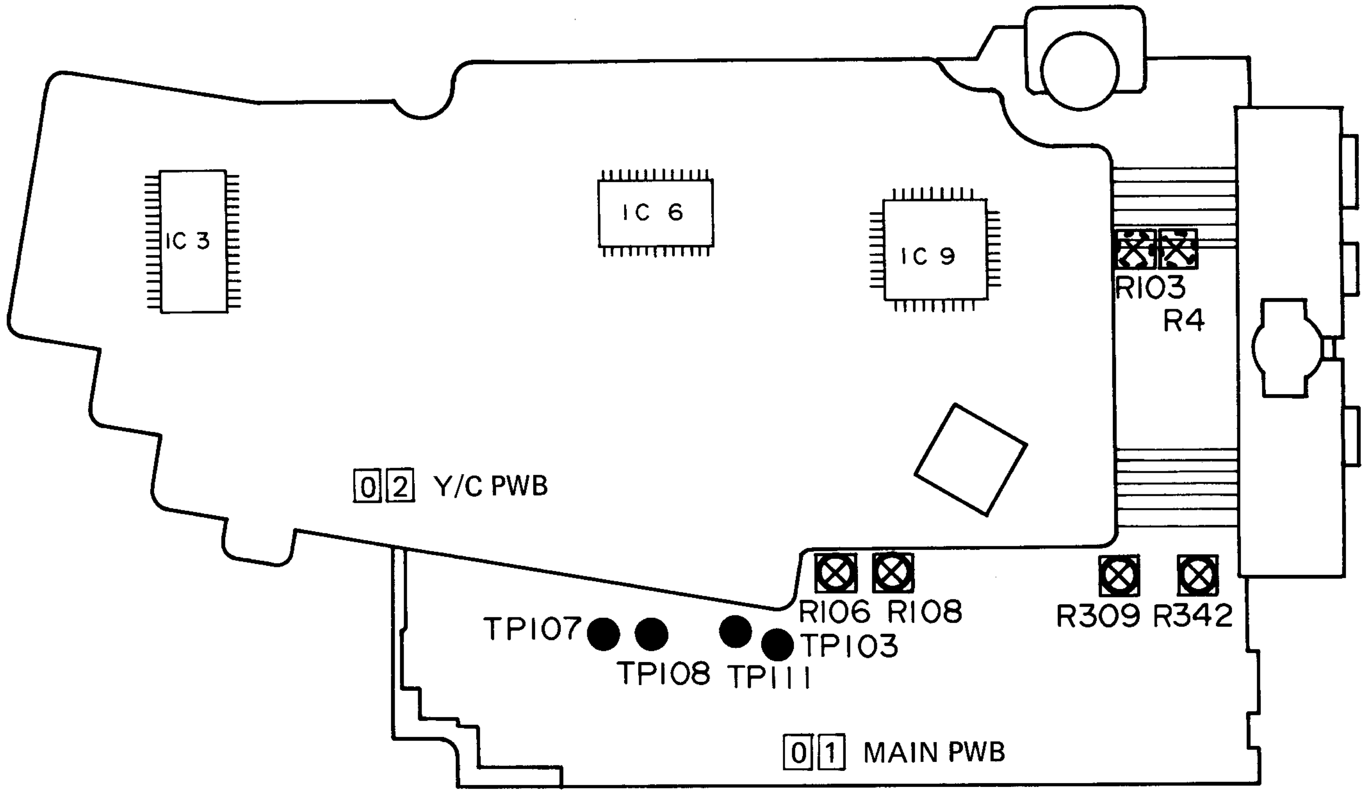
LCD Module board.

LCD Module viewed from rear.

This connector has pins downward.

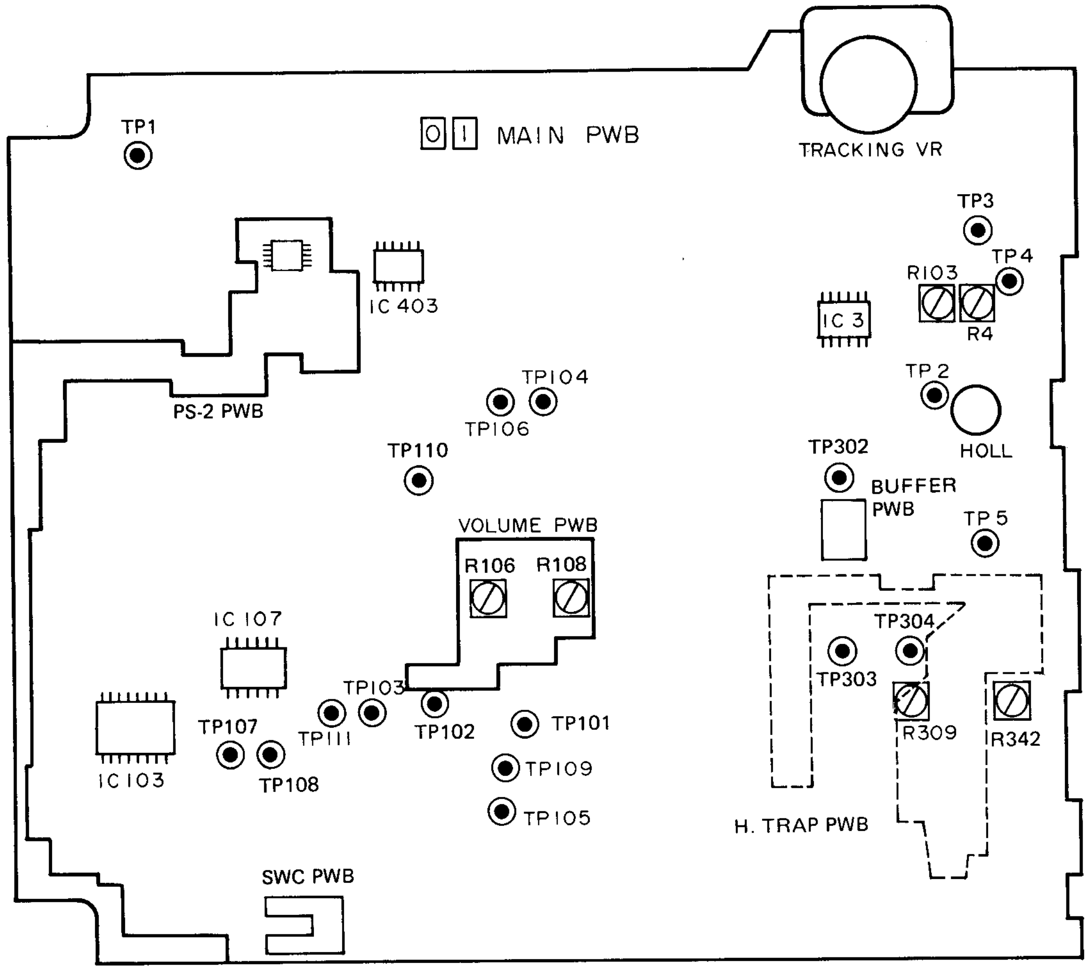
3. 1. 7 VR and TEST POINT

– Y/C and Main –

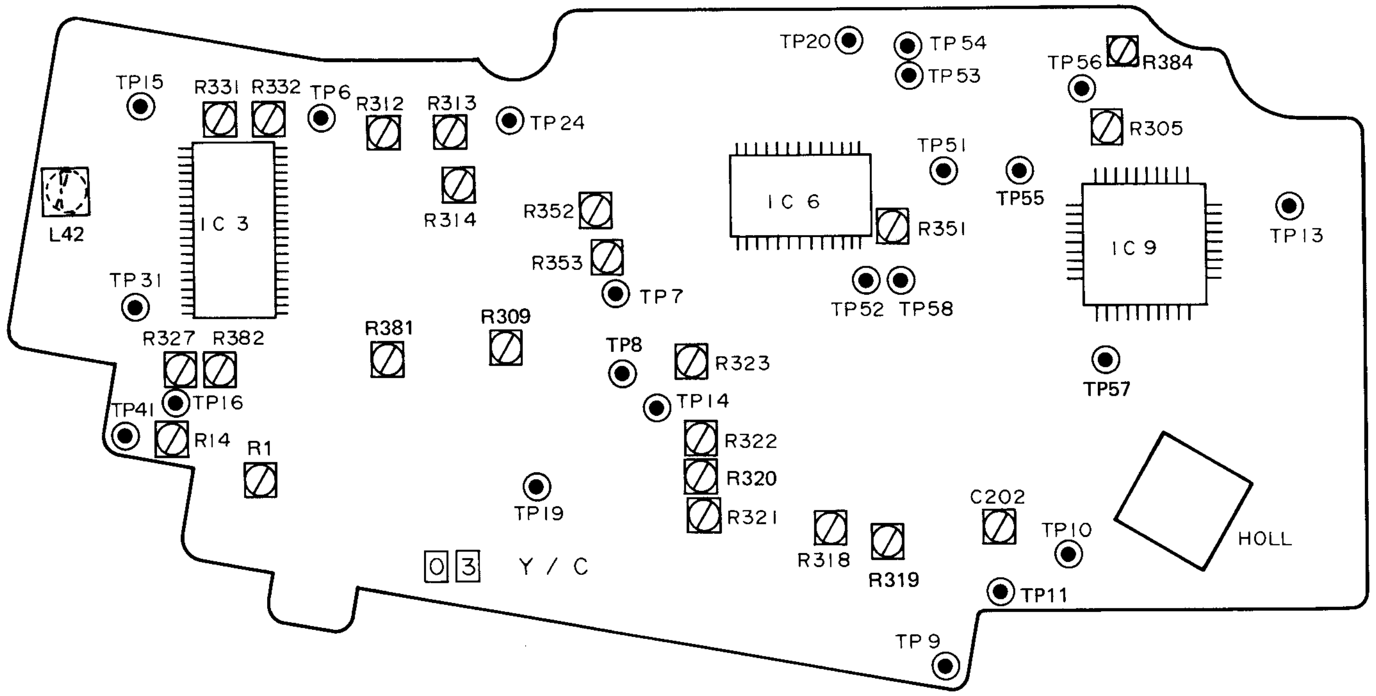

IC 3
IC 6
IC 9
R103
R4
02 Y/C PWB
R106 R108
R309 R342
TP107
TP108
TP111
TP103
01 MAIN PWB

NOTE: FOR THIS ADJUSTMENT, ITIS POSSIBLE WITH Y/C PWB ASS'Y.

– MAIN –


TP1
01 MAIN PWB
TRACKING VR
TP3
TP4
R103
R4
IC 403
IC 3
PS-2 PWB
TP104
TP106
TP110
TP 2
HOLL
TP302
BUFFER PWB
TP 5
VOLUME PWB
R106 R108
IC 107
TP304
TP303
R309
R342
TP103
TP107
TP111
TP102
TP101
IC 103
TP108
TP109
TP105
H. TRAP PWB
SWC PWB

– Y/C –

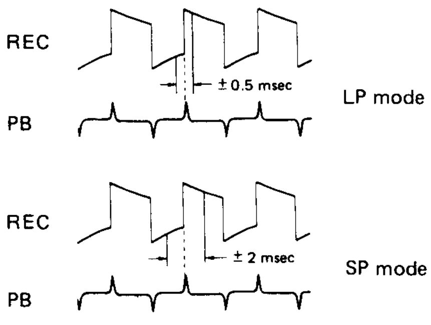

TP20
TP54
TP53
TP56
R384
TP15
R331 R332
TP6
R312
R313
TP24
R305
TP51
L42
IC 3
R314
R352
IC 6
R351
TP55
IC 9
TP13
R353
TP31
TP7
TP52 TP58
R327 R382
R381
R309
TP8
R323
TP57
TP16
TP41
R14
R1
TP14
R322
R320
R321
TP19
R318
R319
C202
TP10
HOLL
03 Y / C
TP11
TP 9

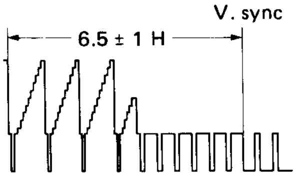
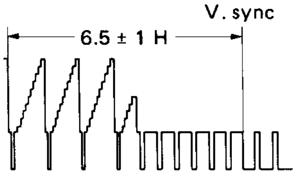
- **For properly and correctly proceeding all the electrical adjustments described in this section, connect the Y/C separator to the Y/C board and supply color bars signal from the signal generator. (Refer to Section 3.1.4.)**

3.2 SWITCHING REGULATOR CIRCUIT (01 MAIN board)

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
1	Switching 8 V Power	• REC without input signal	TP3 01 MAIN	R4 01 (REGULATOR)	1) Connect a digital voltmeter between TP3 and GND, and adjust R4 to obtain 8 V switching power.

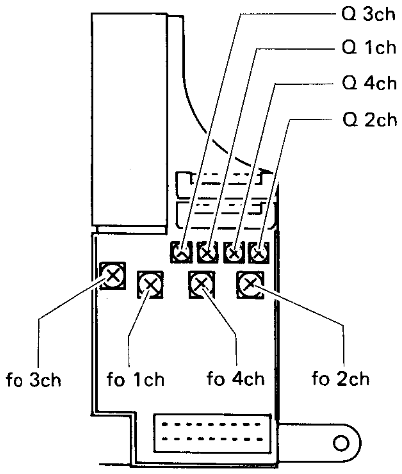
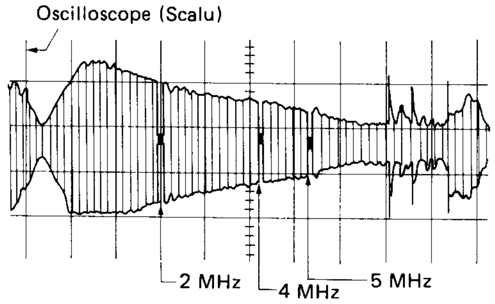
3.3 SERVO CIRCUIT (01 MAIN board)

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
1	LP CTL Delay Adj	• MH-C2PB • Color bars	TP109 (PB FM) 01 MAIN TP111 (DRUM FF) Ext. trigger 01 MAIN	R106 (LP CTL DELAY Adj) 01 MAIN	1) Connect an oscilloscope to TP109 and TP111 which is for external triggering, and set the mode for PB. 2) Adjust R106 so that signal level at TP109 becomes maximum signal level. 3) Turn the tracking VR clockwise and counter-clockwise to confirm that the FM wavefrom is maximum at the VR's center detent position.
2	EP/SP Tracking Preset	• Stairstep • REC then PB • Tracking VR set at center detent position • LP mode and SP mode	TP108 (PB CTL PULSE) 01 MAIN TP111 (DRUM FF) Ext. trigger 01 MAIN	R103 (TRACK-ING PRESET) 01 MAIN	1) Connect an oscilloscope to TP108 and TP111 which is for external triggering, and set the mode for REC to record signals (LP mode). 2) Observe the leading point of waveform at TP108. 3) Play back the signal recorded in the above step 1), and adjust R103 so that relationship between rise-up point of TP108 waveform in REC and its positive pulse in PB becomes 0 ± 0.5 msec. 4) Perform the same procedures in 2) and 3) above in SP mode, and confirm the same relationship (TP108 waveforms in REC and PB) is 0 ± 2 msec.  REC ± 0.5 msec PB LP mode REC ± 2 msec PB SP mode Fig. 3-3-1

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
3	PB Switching Point	• MH-C2 PB • Stairstep (–) trigger	TP13 (VIDEO OUT) $\boxed{0}\boxed{2}$ Y/C TP111 (DRUM FF) Ext. trigger $\boxed{0}\boxed{1}$ MAIN	R108 (PB CTL PULSE) $\boxed{0}\boxed{1}$ MAIN	1) Connect the oscilloscope to TP13 and TP111 which is for external trigger, and play back the alignment tape MH-C2. 2) Set the oscilloscope for external triggering with minus (–) slope signal. 3) Adjust R108 so that the trigger point becomes 6.5 ± 1H before V. sync.  Fig.3-3-2
		(+) trigger			4) Set the oscilloscope for external triggering with plus (+) slope signal. 5) Check up that the trigger point is 6.5 ± 1H before V. sync.  Fig.3-3-3

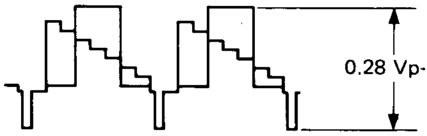
3.4 PREAMP CIRCUIT BOARD

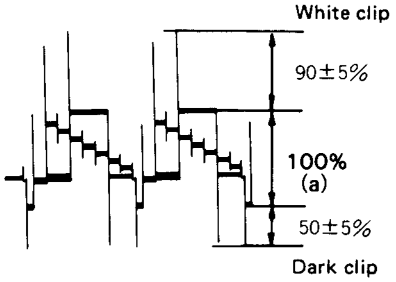
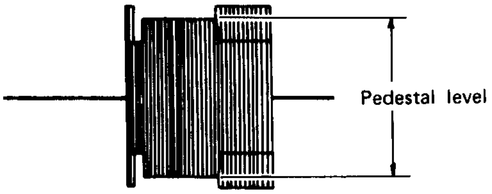
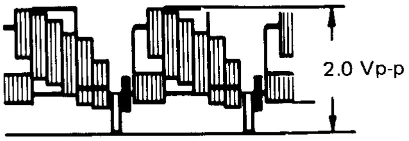
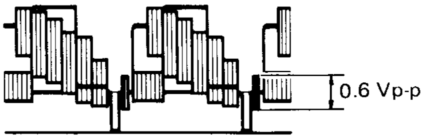
Note: Unless otherwise specified, all test points and adjustment parts are located on the PREAMP board.

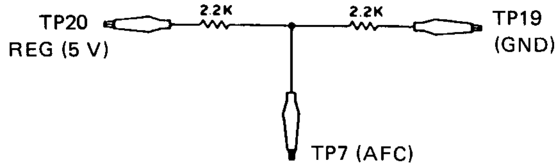
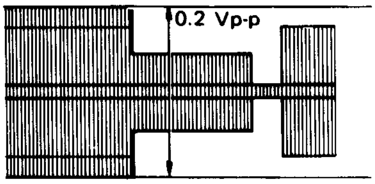
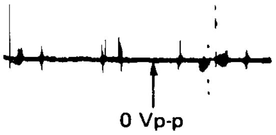
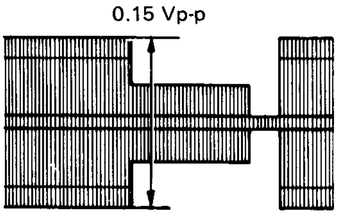
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
1	fo/Q Adj.	• Perform this adjustment only if image reversal ("tearing") or horizontal jitter occurs during REC/PB of scenes with strong light/dark contrast after replacing the heads or preamp.			
		• MH-C2 PB • RF sweep  Q 3ch Q 1ch Q 4ch Q 2ch fo 3ch fo 1ch fo 4ch fo 2ch **Fig. 3-4-1** Pre-amplifier adjustments location	TP109 (TP FM) [0][1] MAIN (SERVO)	CH-1: C2 (fo), R2 (Q) CH-2: C4 (fo), R4 (Q) CH-3: C1 (fo), R1 (Q) CH-4: C3 (fo), R3 (Q) PREAMP	1) Remove Y/C and MAIN boards. Connect these boards with patchcords. Remove the upper cover of the preamp shield case. 2) Connector PREAMP and MAIN boards. Confirm video signal. 3) Connect oscilloscope to TP109 (TP FM) of the MAIN (Servo) board. 4) Observe the TP109 FM waveform and turn CH1 to CH4 clockwise to adjust for maximum 4.8 MHz region. 5) Observe the oscilloscope scale graduations. When the 2 MHz region is 2.5 scale divisions, adjust Q of CH1 to CH4 for 1 scale division.  2 MHz : 4.8 MHz = 2.5 : 1.5 **Fig. 3-4-2**

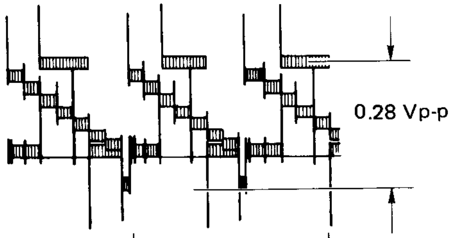
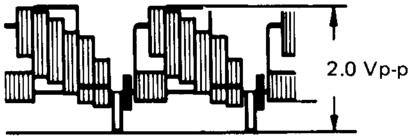
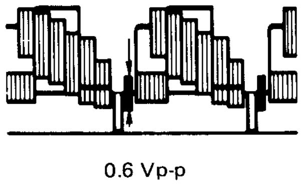
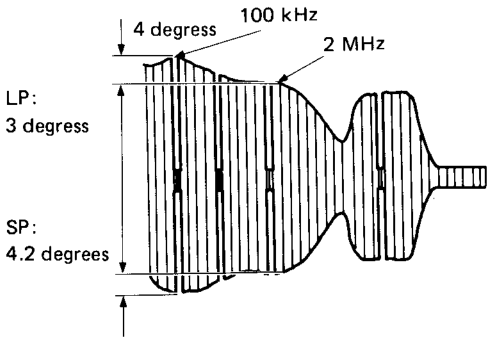
3.5 Y/C CIRCUIT ([0][2] Y/C board)

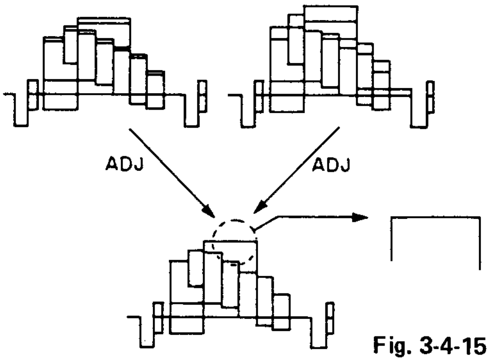
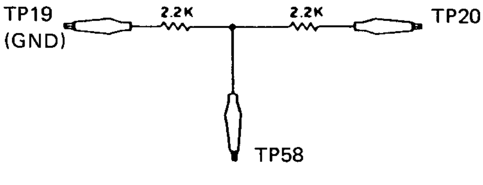
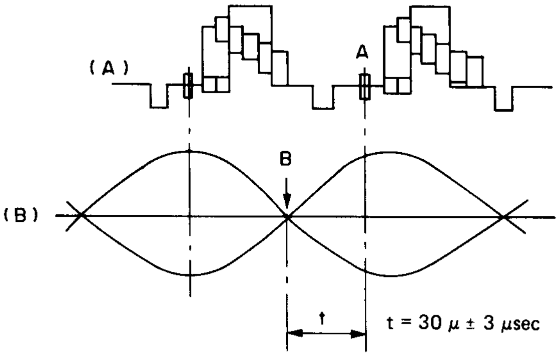
Note: Unless otherwise specified, all test points and adjustment parts are located on the Y/C board.

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
1	AGC Level	• E-E • Color bars • Y/C separator	TP15 (VIDEO Y LEVEL) [0][2] Y/C	R314 (E-E Y LEVEL)	1) Connect the oscilloscope to TP15. 2) Adjust R314 to obtain 0.28 Vp-p for Y level.  **Fig. 3-4-3**
2	Carrier Deviation	• REC • No input signal • REC mode • Color bars	IC2 pin㉘ IC2 pin㉓	R331 (CARRIER) R332 (DEVIATION)	1) Connect the frequency counter to pin 28 of IC2. 2) In recording without input signal, adjust R331 so that frequency at pin 28 of IC2 (counter display) becomes 3.8 MHz ± 50 kHz. 3) In recording color bar signal, adjust R332 so that frequency at pin 23 of IC2 becomes 24 mVp-p. 4) Record and play back the color bar signal. Connect the oscilloscope to TP13. 5) During recording, adjust R332, and then play back so that the Y level becomes 2.0 Vp-p.

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
3	White & Dark Clip	• E-E • Color bars • Y/C separator	TP6 (EMPHASIS)	R313 (DARK CLIP) R312 (WHITE CLIP)	1) With the oscilloscope connected to TP6, adjust R313 and R312 so that white clip becomes 90 ± 5% and dark clip becomes 50 ± 5%, respectively.  Fig. 3-4-4
4	REC FM Level	• REC • Color bars • Y/C separator	Test pin of pre-amplifier PRE AMP (Can be measured from the outside of the shield.)	R327 (REC FM LEVEL) for SP R382 (REC FM LEVEL) for LP	1) Connect the oscilloscope's probe to the test pin of the preamp. 2) Adjust R327, then REC so that the signal level becomes 3.0 Vp-p at where the waveform comes to pedestal level. (SP mode) 3) Adjust R382, then REC so that the signal level becomes 2.0 Vp-p at where the waveform comes to pedestal level. (LP mode)  Fig. 3-4-5
5	E-E Y Level	• E-E • Color bars • Y/C separator	TP13 (VIDEO OUT)	R305 (E-E Y LEVEL)	1) Connect the oscilloscope to TP13. 2) Adjust R305 so that signal level becomes 2.0 Vp-p.  Fig. 3-4-6
6	E-E Color Level	• E-E • Color bars • Y/C separator	TP13 (VIDEO OUT)	R323 (E-E COLOR LEVEL)	1) Adjust R323 so that burst level becomes 0.6 Vp-p at the 75-ohm terminated VIDEO OUT terminal.  Fig. 3-4-7
7	VCO (4.433618 MHz)	• MH-C2 PB • Color bars • TP19 (GND) and TP10 (VCO) short	TP9 (VCO OUT)	C202 (VCO)	1) Connect a 30 kΩ vesistor between TP19 (GND) and TP10 of the Y/C board to make a short circuit. 2) Connect the frequency counter to TP9, and adjust C202 so that frequency (f) becomes: 4.433618 MHz ± 50 Hz.

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
8	AFC	• MH-C2 PB • Color bars • 2.5 V DC to TP7  TP20 REG (5 V) 2.2K 2.2K TP19 (GND) TP7 (AFC)	TP14(AFC ADJ)	R318 (AFC)	1) Supply regulated 2.5 V DC to TP7. (Otherwise 2.5 V DC can be obtained by the illustrated wiring to be connected to TP20 (REG), TP19 (GND) and TP7 (AFC) on the Y/C board. 2) Connect the frequency counter to TP14. 3) Adjust R318 so that frequency (f) at TP14 becomes as follows: f = 5.15 MHz ± 100 kHz.
9	PB Color Level	• MH-C2 PB • Color bars	TP11 (PB COLOR IN)	R319 (PB INPUT COLOR LEVEL)	1) Observing the oscilloscope, adjust R319 to obtain 0.2 Vp-p at TP11 as the maximum signal level. 2) The adjustment of the step 1) should be performed for four channels of CH-1 through CH-4. At this time, confirm that the level difference between channels is within 4 dB.  Fig. 3-4-8
10	Video Noise Cancel	• MH-C2 PB • Color bars	TP31 (NOISE CANCEL)	R381 (VIDEO NOISE CANCEL)	1) Connect the oscilloscope to TP31. 2) Adjust R381 so that signal level at TP31 becomes 0 Vp-p.  Fig. 3-4-9
11	REC Color Level	• REC then PB • Color bars • Y/C separator	TP11 (PB COLOR IN)	R321 (REC COLOR LEVEL) for SP R320 (REC COLOR LEVEL) for LP	1) Connect the oscilloscope to TP11. 2) Record color bars signal, and playing it back adjust the tracking VR to obtain maximum signal level at TP11. 3) In REC mode, adjust R321 so that the maximum level among signals of CH-1 through CH-4 becmoes 0.18 Vp-p. (SP mode) 4) Next, in LP mode, adjust R320 so that the maximum level among signals of CH-1 through CH-4 becmoes 0.18 Vp-p.  Fig. 3-4-10

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
12	PB Y Level	• REC then PB • Color bars • Y/C separator	TP15 TP13 (VIDEO OUT)  Fig. 3-4-11	R309 (PB DEM LEVEL) R384 (PB Y LEVEL) $\boxed{0}\boxed{2}$ Y/C	1) With the oscilloscope connected to TP15, adjust R309 to obtain 0.28 Vp-p for Y level. 2) Connect the oscilloscope to TP13. 3) Adjust R384 so that signal level becomes 2.0 Vp-p.  Fig. 3-4-12
13	LP PB Burst Level	• REC then PB • Color bars • Y/C separator	TP13 (VIDEO OUT)	R322 (PB BURST LEVEL)	1) Connect the oscilloscope to TP13. 2) Adjust R322 to obtain 0.6 Vp-p for burst level.  Fig. 3-4-13
14	Video EQ Adj.	• Color sweep • REC then PB • Y/C separator	TP13 (VIDEO OUT)	R14 (VIDEO EQ) for SP R1 (VIDEO EQ) for LP	1) Connect a 100 μF capacitor between TP19 (GND) and TP8 of the Y/C board to make a shortcircuit. 2) Set markers of color sweep generator to 2 MHz and 100 kHz. 3) Record and play back a color sweep signal to confirm that the 2 MHz level is 0.4 dB ± 1 dB with respect to the 100 kHz level in SP mode, and –2.5 dB ± 0.5 dB in LP mode. 4) With the 2 MHz color sweep signal input, check that level difference between CH-1 and CH-2 is within 2 dB.  LP : 20 log 3/4 ≒ –2.5 dB SP : 20 log 4.2/4 ≒ 0.4 dB Fig. 3-4-14

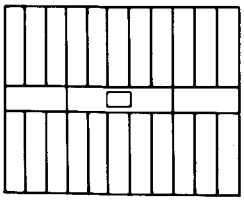
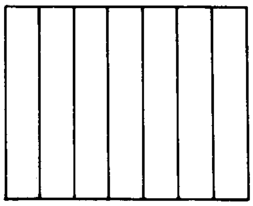
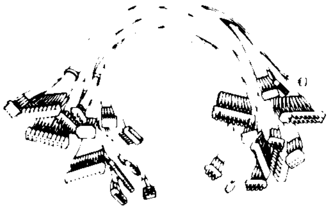
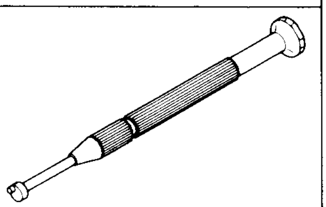
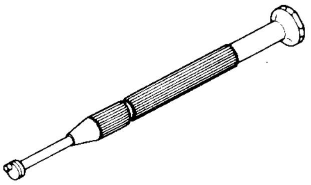
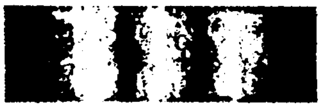
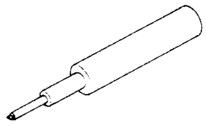
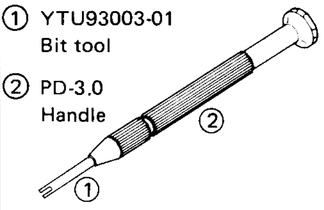
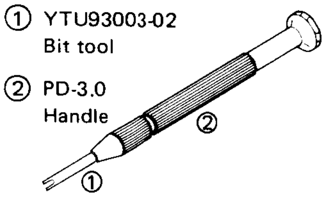
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
15	0.5H Delay Color Level	• MH-C2 PB • Color bars	TP57 (PB COL. OUT)	R353 (0.5H DEYAY COLOR LEVEL)	1) Play back MH-C2. 2) Connect the oscilloscope to TP57 and make a note of the level (A). 3) Short TP53 and TP54 to ground, and again observe the level (B) at TP57. 4) Adjust R353 so that levels (A) and (B) are equal.
16	0.5H Delay Video Level	• CH-C5L PB • Color bars • SEARCH play	TP13 (VIDEO OUT)	R352 (0.5H VIDEO)	1) Connect the oscilloscope to TP13 in playing back the CH-C5L tape. 2) Adjust R352 to obtain the waveform illustrated in Fig. 3-4-15.  Fig. 3-4-15
17	0.5H Jump Det.	• E-E • No input signal	TP52 (VCO)	R351 (0.5H JUMP DET.)	1) Supply regulated 2.5 V DC to TP58 (or connect the test instrument shown in Fig. 3-4-16 to TP19, TP20 and TP58). 2) Connect the frequency counter to TP52. 3) Adjust R351 to obtain 30 kHz ± 0.2 kHz frequency at TP52.  Fig. 3-4-16
18	APC Error Phase	• MH-C2 PB • Color bars	TP55 (VIDEO IN) TP51 (7.8k TUNING)  Fig. 3-4-17	L42	1) Connect the dual trace oscilloscope to TP55 and TP51. Adjust the core of L42 to obtain the burst phase (A) and 7.8 kHz waveform phase (B) indicated in the figure. t = 30 μ ± 3 μsec.

3.6 AUDIO CIRCUIT ($\boxed{0}\boxed{1}$ MAIN board)

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
1	PB Level	• MH-C2 (1 kHz) • PB • LINE OUT	LINE OUT $\boxed{0}\boxed{1}$ MAIN	R309 (AUDIO PB LEVEL) $\boxed{0}\boxed{1}$ MAIN	1) Play back the alignment tape MH-C2 (1 kHz segment) and adjust R309 so that signal level at LINE OUT becomes –6 dBs ± 0.5 dBs.
2	Audio Bias Level	• REC • No audio signal input	TP304 (BIAS LEVEL-2) TP303 (BIAS LEVEL-1) $\boxed{0}\boxed{1}$ MAIN	R342 (AUDIO BIAS LEVEL) $\boxed{0}\boxed{1}$ MAIN	1) Connect an audio tester's HOT side to TP303 and GND to TP304, respectively. 2) Adjust R342 so that bias level between TP303 and TP304 becomes 2.0 mVrms.

3.7 ADJUSTMENTS OF CAMERA SECTION

3.7.1 Required tools and test equipment for camera adjustments

Grey scale pattern (GS-2A) Reflection type, 11 steps, $\gamma = 2.2$	Color bars pattern (CC-2A) Reflection type, 7-color	Patching cord YTU93001C	Back focus adjustment handle PUJ37186A
			
Auto focus unit Back focus adjustment handle PUJ37186B	Auto focus unit Back focus adjustment chart PUJ93944	Adjustment jig for compact VTR YTU93004	Chip parts replacement jig ass'y YTU93003A
			 ① YTU93003-01 Bit tool ② PD-3.0 Handle ② ①
Chip parts replacement jig ass'y YTU93003B			
 ① YTU93003-02 Bit tool ② PD-3.0 Handle ② ①			

3.7.2 Other tools and instruments necessary for adjustments

- Halogen lamps (3 200 K each) . . . . 2 or more
- Color temperature conversion filters

	KENKO	KODAK WRATTEN
Cold	C8	80C
	C8 + CC10Y	80C + CC10Y
	C12	82C + 82C + 82B
	C14	80A + 82
	C16	80A + 82B
	C24	80A + 80B
Warm	W4	81D
	W14	85B + 81

- ND filter
- 9.6 V DC supply (AA-V5EG/EK or equivalent)
- Skin tone test pattern (of clear color phase)
- A/V output cable

3.7.3 Measuring instruments necessary for adjustments

- Oscilloscope
- Vectorscope
- Color video monitor
- DC power supply
- Digital voltmeter
- Lux meter
- Color temperature meter

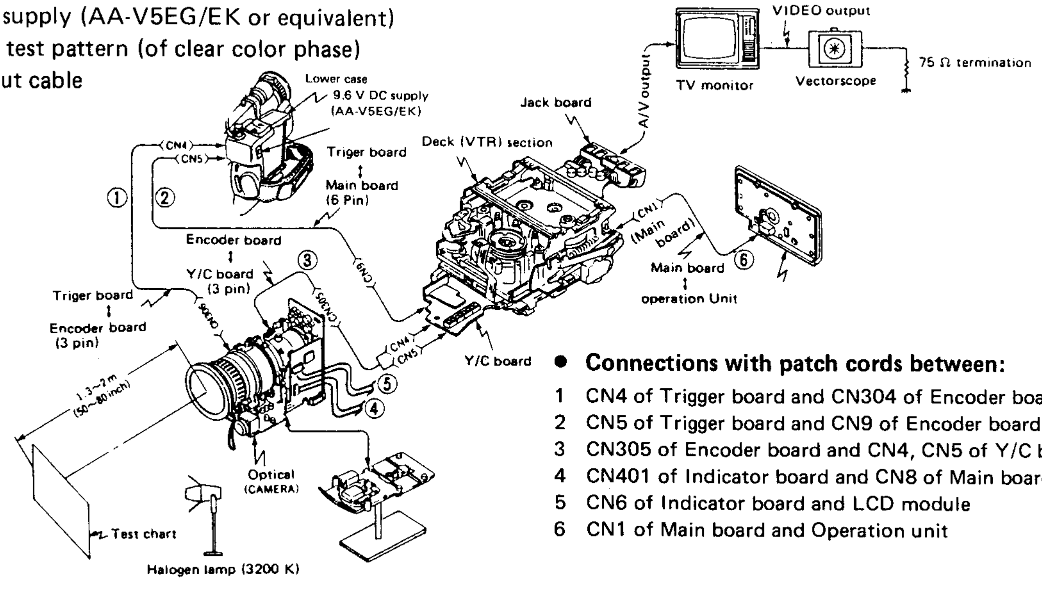
3.7.4 Standard setting and connection for adjustments and operation of the camera section

As the standard, separate the camera and deck sections each other and connect them with patch cords (see the figure below).

For the connection, connect the DC cord to the DC IN terminal of the lower case and connect patch cords to the connectors CN4 and CN5 of the trigger board inside the lower case. With these connections, supply 9.6 V DC to the MAIN and ENCODER boards to operate the camera section.

For a mode selection, perform it by the operation unit.

After the setting-up finishes, press the REHEARSAL button of the operation unit to confirm image on the monitor.


VIDEO output
TV monitor
Vectorscope
75 Ω termination
A/V output
Jack board
Lower case
9.6 V DC supply (AA-V5EG/EK)
Triger board ↕ Main board (6 Pin)
Deck (VTR) section
CN4
CN5
①
②
CN1 (Main board)
Main board ↕ operation Unit
⑥
Encoder board ↕ Y/C board (3 pin)
③
CN9
CN305
Triger board ↕ Encoder board (3 pin)
CN306
CN4
CN5
Y/C board
⑤
④
1.3~2 m (50~80 inch)
Optical (CAMERA)
Test chart
Halogen lamp (3200 K)

- **Connections with patch cords between:**

1 CN4 of Trigger board and CN304 of Encoder board (to supply 9.6 V DC)
2 CN5 of Trigger board and CN9 of Encoder board (to supply 9.6 V DC)
3 CN305 of Encoder board and CN4, CN5 of Y/C board (for Y/C output)
4 CN401 of Indicator board and CN8 of Main board (flat cable)
5 CN6 of Indicator board and LCD module
6 CN1 of Main board and Operation unit

3.7.5 Preparation and preliminary checks before adjustments

- **Precautions**

Electrical adjustments described in this section are generally required after replacing electrical parts.

In the event of malfunction with electrical circuits, troubleshooting with the aid of proper test instruments must be done first, and then, commence necessary repair, replacement, and adjustment, etc.

Since there are some troubles and symptoms which need not be adjusted, avoid unnecessary disturbance of the control settings and other items than the objects.

- **Preparation and preliminary check**

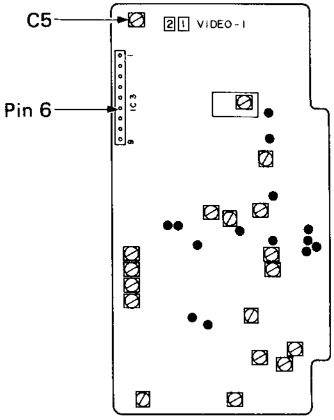
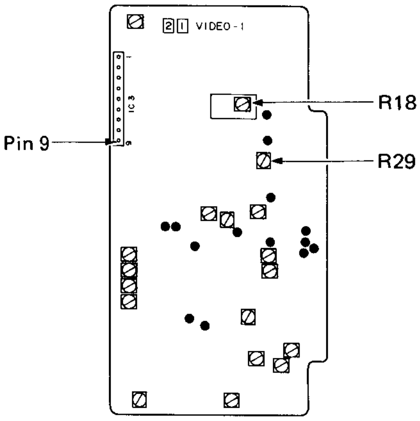
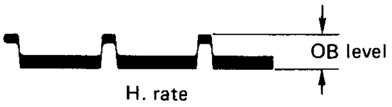
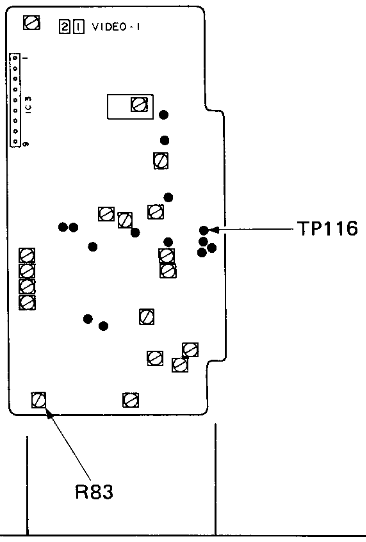
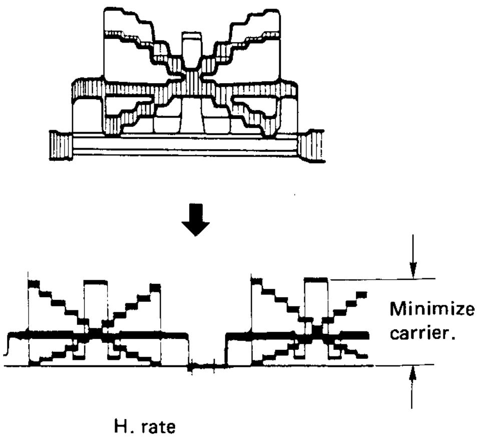
1. Test pattern illumination
   Use halogen lamps of 3200°K or more and set them to illuminate the test pattern evenly at approximately 4,000 Lux with the aid of a lux meter.
   Note that proper illumination of the test pattern is essential for performing correct adjustments. (It is recommended to use two or more halogen lamps.)
2. Test patterns
   Use new and clean test patterns.
3. This model adopts the fully automatic color temperature sensing system. Any adjustment such as white balance adjustment relating to the system is remarkably effected by ray and light applied to the color sensor.
   Pay careful attention to other light (fluorescent lamp, etc.) than the proper pattern illumination.
4. For adjustments, set the controls to the following positions unless otherwise specified.

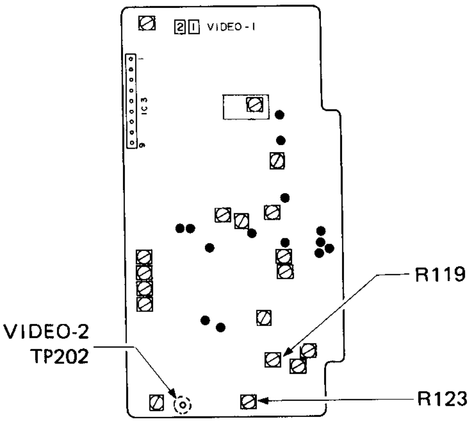
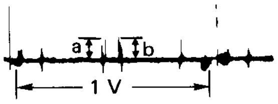
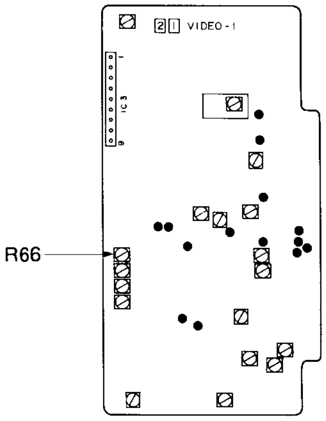
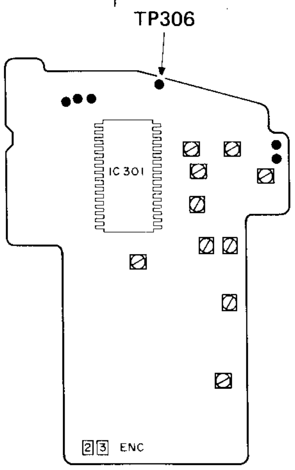
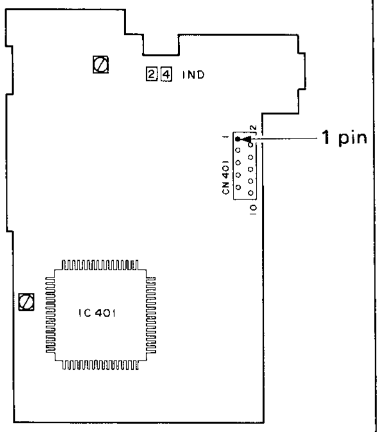
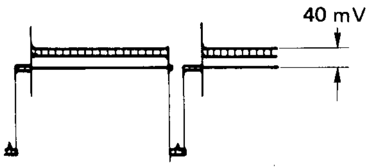
Control		Setting position
White Balance	:	PRESET INDOOR
Focus	:	MANUAL
Shutter Speed	:	STD
Iris	:	AUTO

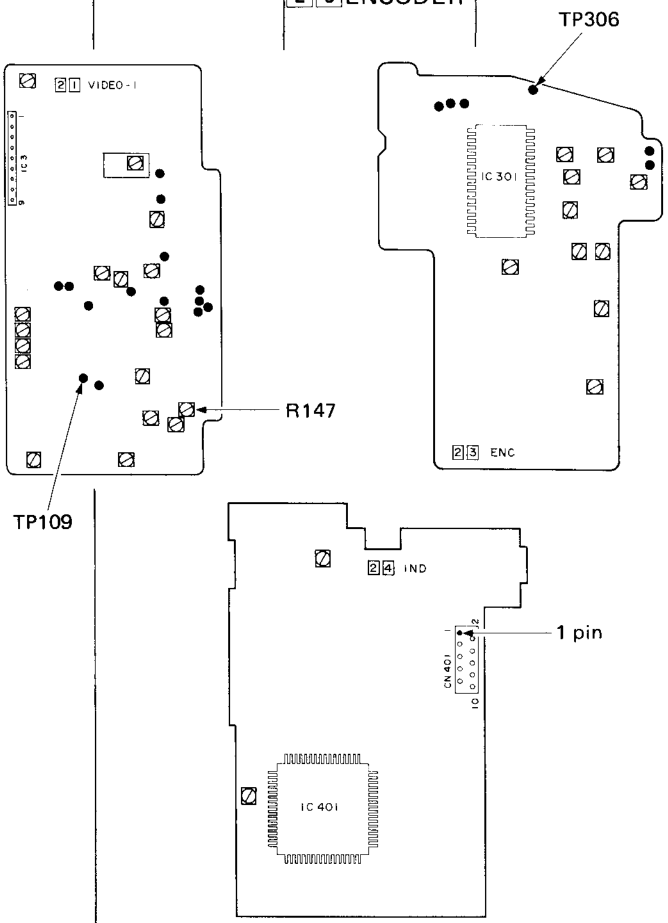
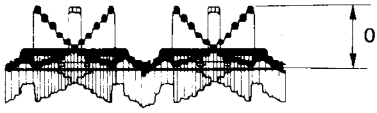
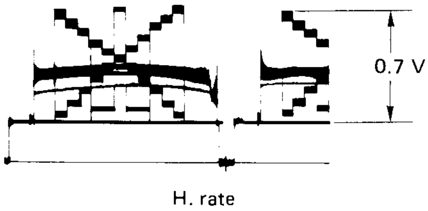
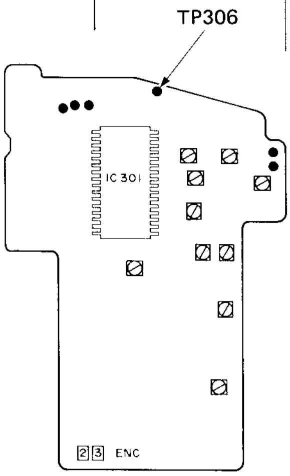
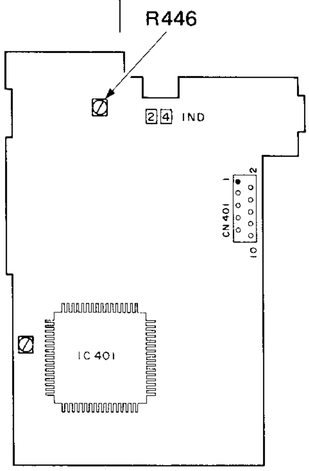
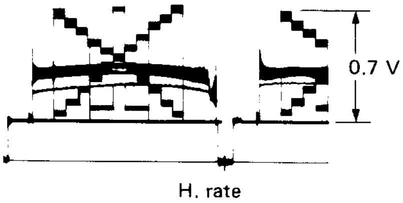
3.7.6 Adjustment procedure

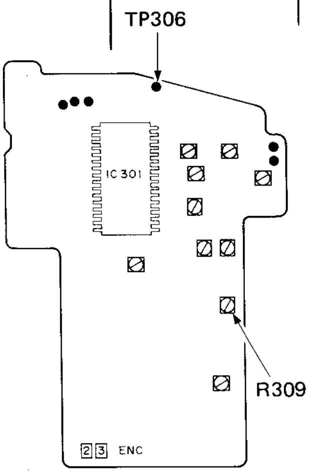
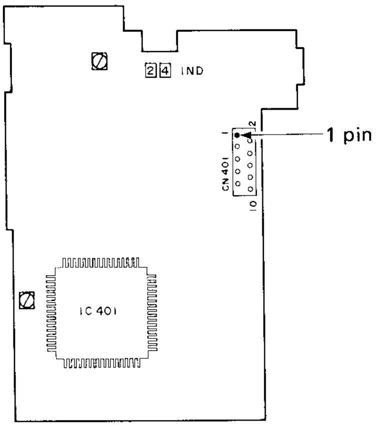
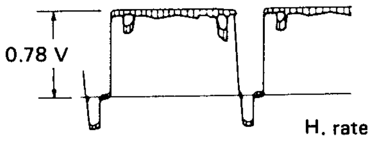
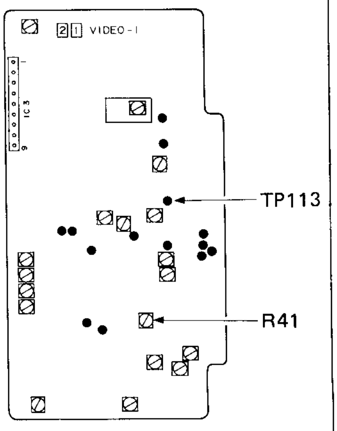
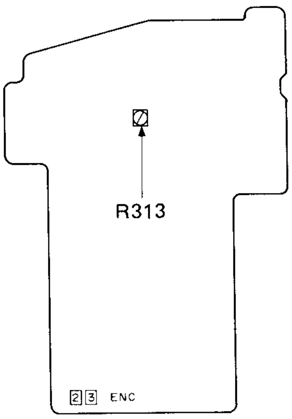
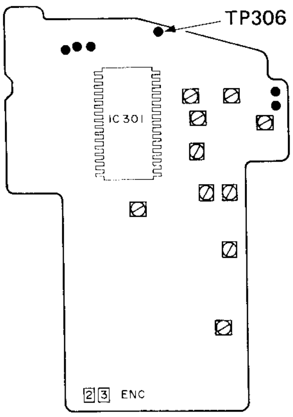
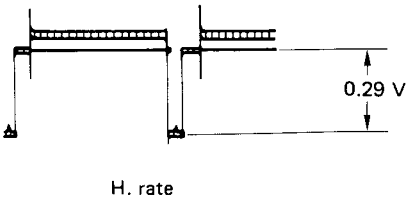
The following are the whole steps to adjust all VRs and other controls of the camera section in the order of adjustments. Consequently, here are some steps unnecessary for practical adjustments and repairs. Perform only the necessary items in practice.

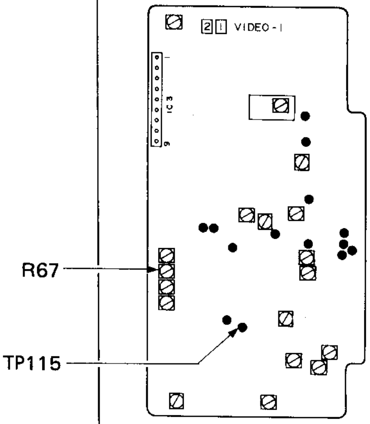
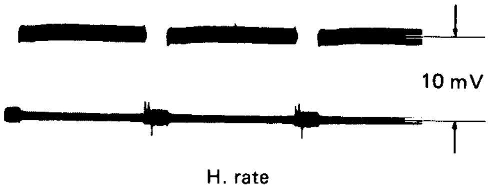
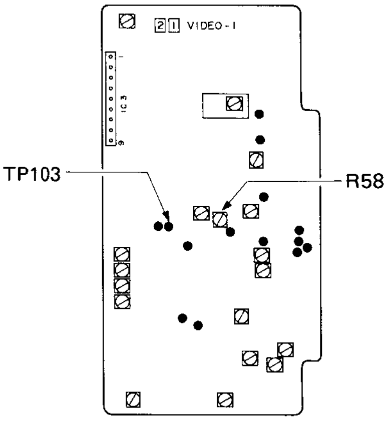
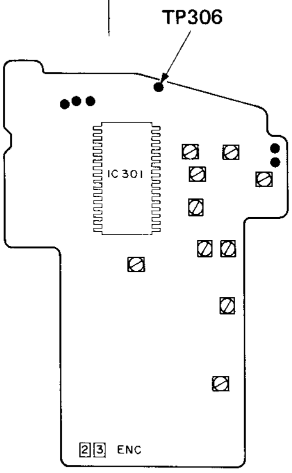
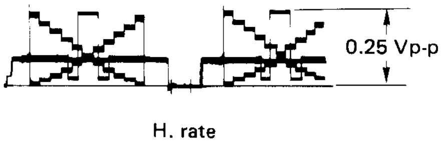
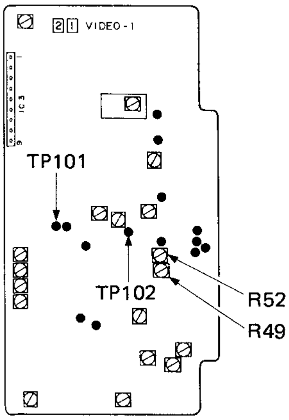
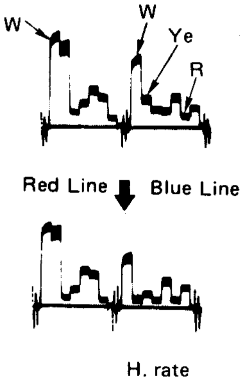
1. Clock Osc. (VIDEO-1 C5)
2. Blooming (VIDEO-1 R29, RB, R13)
3. Y_H Balance (VIDEO-1 R83)
4. V. Edge (2H/H) Balance (VIDEO-1 R119, R123)
5. Y_H Setup (VIDEO-1 R66)
6. Y_H Gain (VIDEO-1 R147)
7. EE LEVEL (INDICATOR R446)
8. White Clip (ENCODER R309)
9. AGC Gain (VIDEO-1 R41)
10. Sync. Level (ENCODER R313)
11. Y_L Setup (VIDEO-1 R67)
12. Y_L Process INPUT LEVEL (VIDEO-1 R58)
13. R/B Separation (VIDEO-1 R52, R49)
14. R/B Process INPUT LEVEL (FAW R537, R521)
15. Chroma Offset (VIDEO-2 R229)
16. Color Difference Balance (VIDEO-2 R244)
17. Noise Suppressor (VIDEO-2 R248)
18. Carrier Balance (ENCODER R326,R327,R353,R354)
19. Preset Indoor (VIDEO-1 R54, R56, R68, R110)
20. Preset FL (FAW R540, R524)
21. Preset Outdoor (FAW R543, R527)
22. Auto White Indoor (FAW R503, R506)
23. Auto White Outdoor (FAW R553, R549)
24. Indoor Limiter (FAW R515, R534)
25. Outdoor Limiter (FAW R518, R530)
26. Burst Level (ENCODER R336)
27. Burst Phase, B-Y Gain, Chroma Gain, Chroma phase, R-Y phase (VIDEO-1 R144, ENCODER R307, R333, R330, R355)
28. Indicator Adjust (IND R402)
29. Back Focus

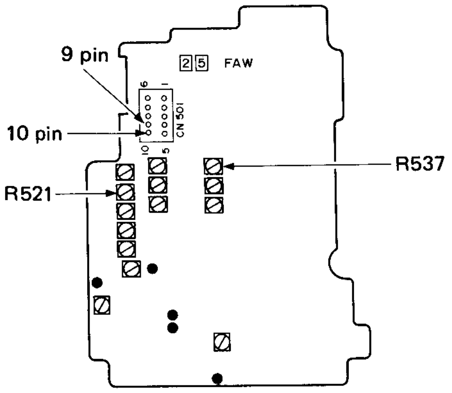
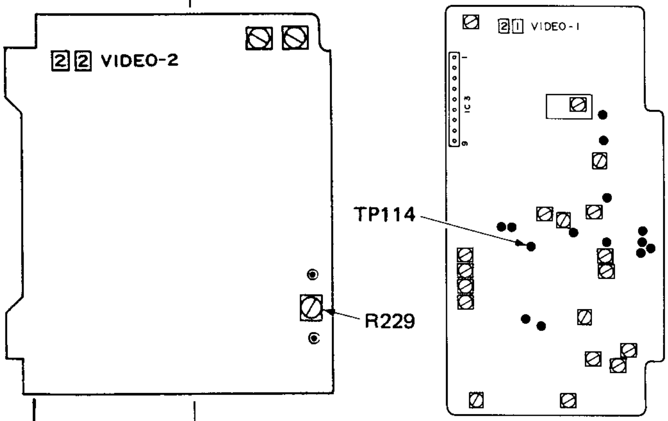
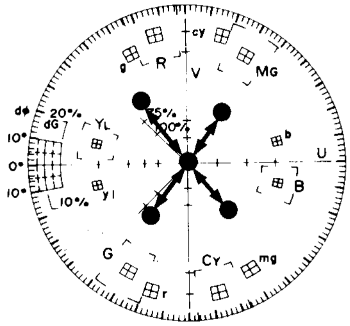
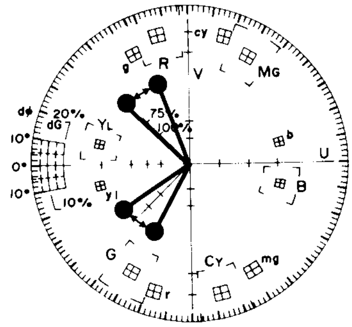
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
1	Clock Osc.  C5 2 1 VIDEO-1 Pin 6 IC3	–	IC3 Pin 6 2 1 VIDEO-1	C5 (CLOCK OSC) 2 1 VIDEO-1	1) Connect a frequency counter to IC3 pin 6, and adjust C5 to obtain 12.875000 MHz ± 40 Hz.
2	Blooming  2 1 VIDEO-1 IC3 R18 R29 Pin 9	–	TV-monitor IC3 9 pin 2 1 VIDEO-1	R29 (BLOOMING) 2 1 VIDEO-1 R18 (OB level) RB board	1) Cap the lens and observe waveform at pin of IC3 of the 2 1 VIDEO-1 board. 2) Adjust R18 so that the OB level becomes maximum.  OB level H. rate 3) Open the cap and pick up a fluorescent light and observe the image on a TV monitor. 4) Turn R29 fully in both directions and notice the range in which blooming occurs. 5) Then adjust R29 to where blooming is absent. 6) Cap the lens and adjust R18 so that OB level becomes 50 mV.
3	Y_H Balance  2 1 VIDEO-1 IC3 TP116 R83	Grey scale	TP116 (1H DL) 2 1 VIDEO-1	R83 (Y_H BALANCE) 2 1 VIDEO-1	1) Pick up the grey scale pattern and observe waveform at TP116. 2) Adjust R83 to minimize carrier waveform on the whole.  Minimize carrier. H. rate

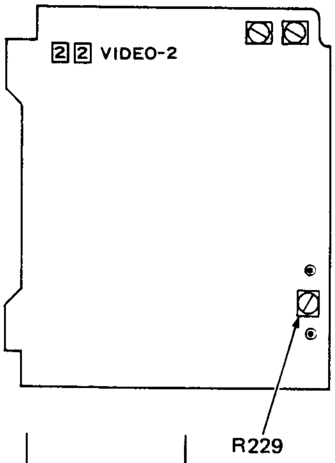
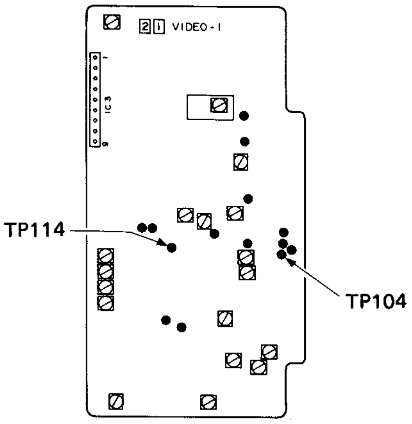
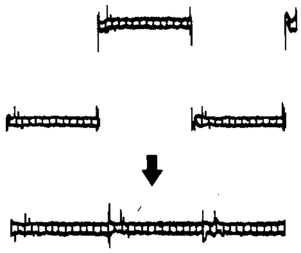
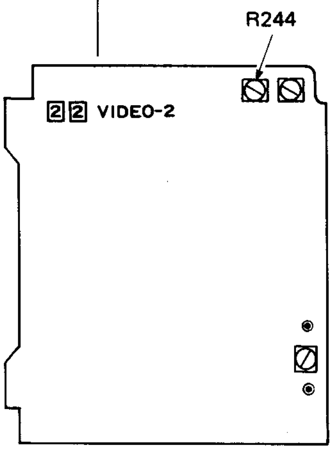
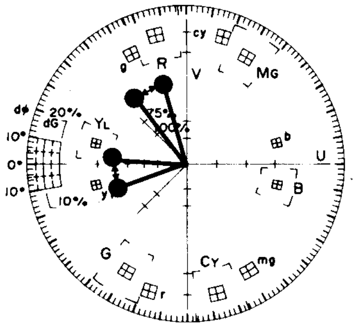
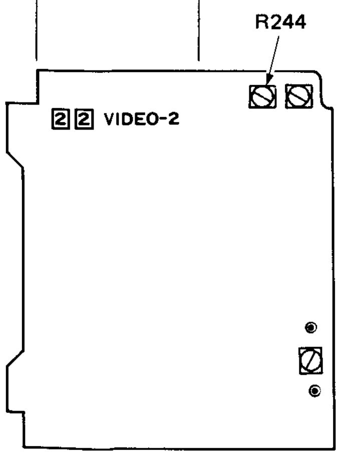
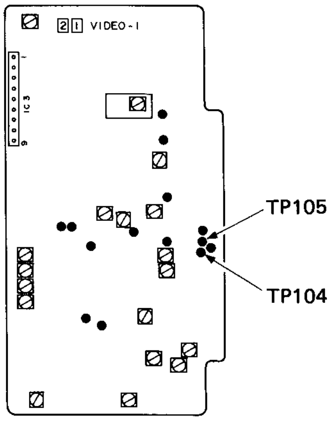
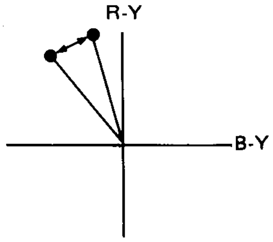
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
4	V. Edge (2H/1H) Balance	Grey scale  21 VIDEO-1 IC3 VIDEO-2 TP202 R119 R123	TP202 (V. EDGE) $\boxed{2}\boxed{2}$ VIDEO-2	R119 (V. EDGE 2H) R123 (V. EDGE 1H) $\boxed{2}\boxed{1}$ VIDEO-1	1) Pick up the grey scale pattern and observe waveform at TP202. 2) Adjust R123 so that average level of the waveform becomes minimum. 3) Next sdjust R119 so that levels of [a] and [b] of the waveform (See figure) becomes equal.  V. rate
5	Y_H Setup	–  21 VIDEO-1 IC3 R66	TP306 (Y OUT) $\boxed{2}\boxed{3}$ ENCODER  TP306 IC301 23 ENC  24 IND 1 pin CN401 IC401	R66 (Y_H SETUP) $\boxed{2}\boxed{1}$ VIDEO-1	1) Connect a wire to pin 1 of CN401 of the $\boxed{2}\boxed{4}$ IND board and GND. 2) Adjust R66 so that the setup level at TP306 becomes 40 mV. 3) Disconnect the wire from GND. **Note:** After the adjustment is completely performed, remove the wire from pin 1 of CN401 of $\boxed{2}\boxed{4}$ IND board.  H. rate

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
6	YH Gain	Grey scale	TP109 (SAMPLING) $\boxed{2}\boxed{1}$ VIDEO-1 TP306 (Y OUT) $\boxed{2}\boxed{3}$ ENCODER  21 VIDEO-1 IC3 R147 TP109 TP306 IC301 23 ENC 24 IND 1 pin CN401 1 2 10 IC401	R147 (YH GAIN) $\boxed{2}\boxed{1}$ VIDEO-1	1) Connect the oscilloscope to TP109 with a resistor of approx. 10 kΩ, and pick up the grey scale pattern. 2) Connect a wire to pin 1 of CN401 of $\boxed{2}\boxed{4}$ IND board, and supply DC voltage so that signal level at TP109 becomes 0.2 V.  3) Connect the oscilloscope to TP306 and adjust R147 to obtain 0.7 V of signal level.  4) Open the wired circuit. 5) Again confirm the YH setup of the above step 5. **Note:** After completion of the adjustment, remove the wire from CN401 pin 1 of $\boxed{2}\boxed{4}$ IND board.
7	EE Level	Grey scale	TP306 (Y OUT) $\boxed{2}\boxed{3}$ ENCODER  TP306 IC301 23 ENC	R446 (IRIS ADJ) $\boxed{2}\boxed{4}$ INDICATOR  R446 24 IND CN401 1 2 10 IC401	1) Connect the oscilloscope to TP306. 2) With the iris set to AUTO, adjust R446 so that EE level becomes 0.7 V. 

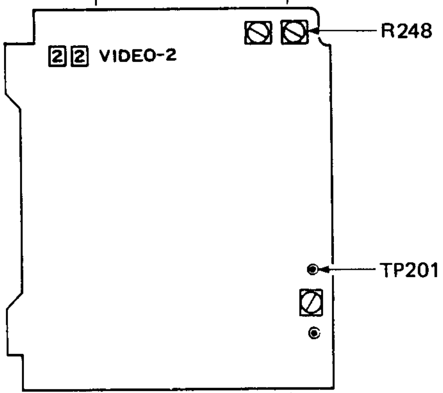
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
8	White Clip	Grey scale  TP306 IC 301 R309 23 ENC	TP306 (Y OUT) 23 ENCODER	R309 (W. CLIP) 23 ENCODER  24 IND CN401 1 pin IC 401	1) Connect the oscilloscope to TP306 and pick up the grey scale pattern. 2) Connect a wire to pin 1 of CN401 of 24 IND board, and load the test point with DC voltage so that signal waveform becomes broken on the oscilloscope screen (Iris: open, supply voltage: 2.6 V approx.). 3) Adjust R309 to obtain 0.78 V of clipping level. 4) Open the wired circuit. **Note:** After the adjustment is completed, remove the wire from CN401 pin 1 of 24 IND board. 
9	AGC	Lens: Closed  21 VIDEO-1 IC3 TP113 R41	TP113 (AGC) 21 VIDEO-1	R41 (AGC) 21 VIDEO-1	1) Cap the lens. 2) With the oscilloscope connected to TP113, sdjust R41 to obtain 1.1 V of the DC voltage.
10	Sync Level	Lens: Closed  	TP306 (Y OUT) 23 ENCODER  TP306 IC 301 23 ENC	R313 (SYNC LEVEL) 23 ENCODER	1) Cap the lens. 2) Adjust R313 so that signal level at TP306 becomes 0.29 V. 

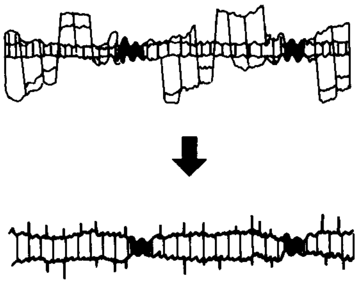
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
11	YL Setup	Lens: Closed  2 1 VIDEO-1 IC3 R67 TP115	TP115 (YL) 2 1 VIDEO-1	R67 (YL SETUP) 2 1 VIDEO-1	1) Cap the lens. 2) Connect the oscilloscope to TP115. 3) Adjust R67 so that the setup level becomes 10 mV. 
12	YL Process Input Level	Grey scale  2 1 VIDEO-1 IC3 TP103 R58	TP306 (Y OUT) 2 3 ENCODER TP103 (YL) 2 1 VIDEO-1  TP306 IC301 2 3 ENC	R58 (YL LEVEL) 2 1 VIDEO-1	1) Observing the oscilloscope, confirm that signal level at TP306 is 0.7 V. (Refer to the step 7 "EE Level".) 2) Connect the oscilloscope to TP103 and adjust R58 so that signal level at TP103 becomes 0.25 Vp-p.  0.25 Vp-p H. rate
13	R/B Separation	Color bar chart  2 1 VIDEO-1 IC3 TP101 TP102 R52 R49	TP101 (R) TP102 (B) 2 1 VIDEO-1  W W Ye R Red Line Blue Line H. rate	R52 (RED SEPA.) R49 (BLUE SEPA.) 2 1 VIDEO-1	1) Pick up the color bar chart. 2) Observe waveform at TP101 with the oscilloscope and adjust the oscilloscope's time axis to check signals of red and blue lines respectively. 3) Taking notice the blue line, adjust R52 to equalize signals levels of the color pattern's yellow and red sections. 4) In the same manner as in 2) above, observe waveform at TP102 and adjust its time axis. 5) Noticing the blue line, adjust R49 to equalize signal levels of the color pattern's yellow and red sections. **Note:** The blue line means the scanning line that is the smaller in signal level of the color pattern's white section.

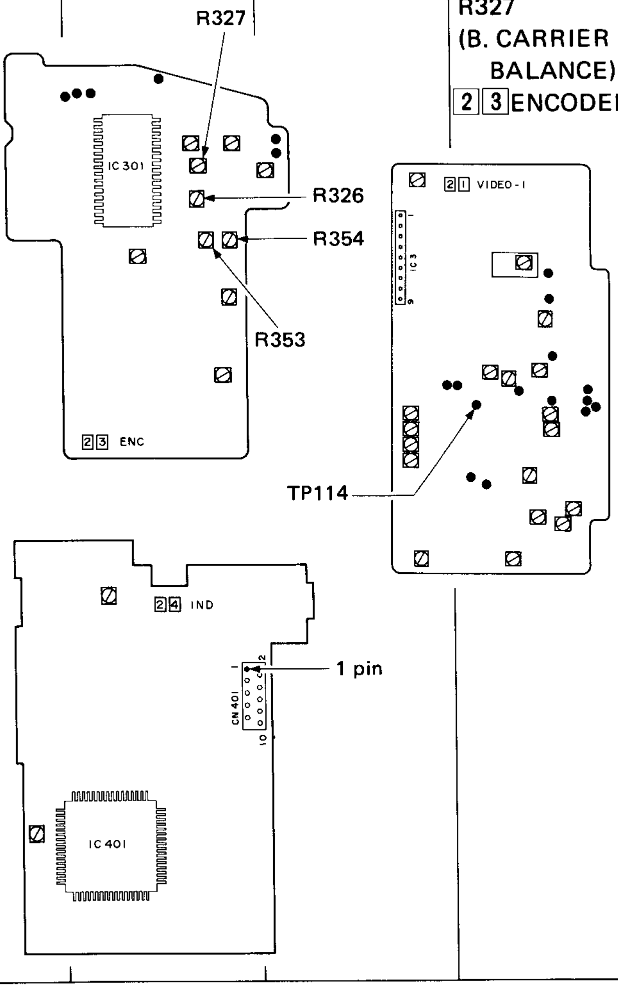
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
14	P/B Process Input Level  9 pin 25 FAW CN501 10 pin R537 R521	Grey scale	CN501 pin 9 CN501 pin 10 25FAW	R537 (PRESET R INDOOR) R521 (PRESET B INDOOR) 25FAW	1) With the oscilloscope connected to pin 9 of CN501, and pick up the grey scale. Adjust R537 to obtain 2.58 V of DC voltage. 2) Change the oscilloscope connection to pin 10 of CN501, and adjust R521 to obtain 2.74 V of the DC voltage.
15 (A)	Chroma Offset  22 VIDEO-2 R229 21 VIDEO-1 IC3 TP114	–	Vectorscope TP114 (P. CTL) 21 VIDEO-1	R229 (CHROMA OFFSET) 22 VIDEO-2	1) Shortcircuit between CN401 pin 1 of 24 IND board and GND with a wire. 2) Connect a wire between TP114 and GND. 3) Adjust R229 so that dots are positioned at the same point being into one. 4) Disconnect the wires from GND. **Note:** After the complete adjustment, remove the wire from CN401 pin 1 of 24 IND board.  cy R V MG 20% dG YL 75% 100% 10° 0° 10° 10% b U B yl G CY mg r LINE SW CARR BAL and CARR. BAL is normal.  cy R V MG 20% dG YL 75% 100% 10° 0° 10° 10% b U B yl G CY mg r LINE SW CARR BAL and CARR BAL isn't adjustment.

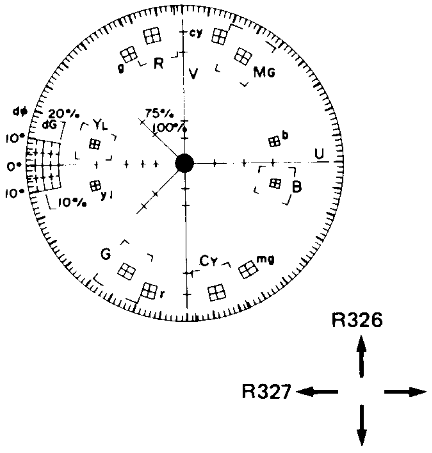
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
15 (B)	Chroma Offset  22 VIDEO-2 R229	–	TP104 (B-Y) TP114 (P. CTL) 21 VIDEO-1  21 VIDEO-1 IC3 TP114 TP104	R229 (CHROMA OFFSET) 22 VIDEO-2	1) Connect a wire between pin 1 of CN401 of 24 IND board and GND. 2) Connect a wire between TP114 and GND. 3) Connect the oscilloscope to TP104 and adjust R229 to become the straight signal. 4) Disconnect the wires from GND. **Note:** After complete adjustment, remove the wire from CN401 pin 1 of 24 IND board. 
16 (A)	Color Difference Balance  R244 22 VIDEO-2	Color bar chart	Vectorscope	R244 (COLOR DIF. BAL.) 22 VIDEO-2	1) Pick up the color bar chart. 2) By use of a vectorscope, adjust R244 to minimize moreement of red signal.  R MG cy V YL U B G CY mg 75% 100% 20% 10% 10° 0° 10°
16 (B)	Color Difference Balance  R244 22 VIDEO-2	Color bar chart	TP104 (B-Y) TP105 (R-Y) 21 VIDEO-1  21 VIDEO-1 IC3 TP105 TP104	R244 (COLOR DIF. BAL.) 22 VIDEO-2	1) Pick up the color bar chart. 2) Set the oscilloscope to observe signal from TP104 on the X-axis while TP105's signal on the Y-axis (X-Y mode). 3) Adjust R244 to minimize the red signal's movement.  X-Y mode

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
17	Noise Suppressor Balance	Color bar chart	TP201 (COLOR NOISE) 22 VIDEO-2	R248 (NOISE SUP) 22 VIDEO-2	1) With the oscilloscope connected to TP201 pick up the color bar chart. 2) Adjust R248 to uniform waveform level at TP201 to the limit.
18 (A)	Carrier Balance	–	Vectorscope TP114 (P. CTL) 21 VIDEO-1	R353 (B-Y LINE SW CARR BAL) R354 (R-Y LINE SW CARR BAL) R326 (R. CARRIER BALANCE) R327 (B. CARRIER BALANCE) 23 ENCODER	1) Shortcircuit between pin 1 of CN401 of 24 IND board and GND with a wire. 2) Connect a wire between TP114 and GND. 3) Adjust R353, R354, R326 and R327 so that dots are positioned at the center of the vectorscope. 4) Disconnect the wires from GND. **Note:** After completion of the adjustment, remove the wire from CN401 pin 1 of 24 IND board.

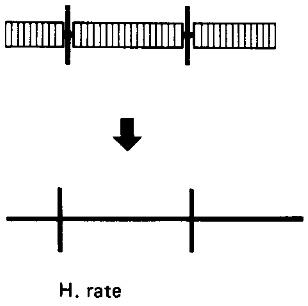

22 VIDEO-2
R248
TP201

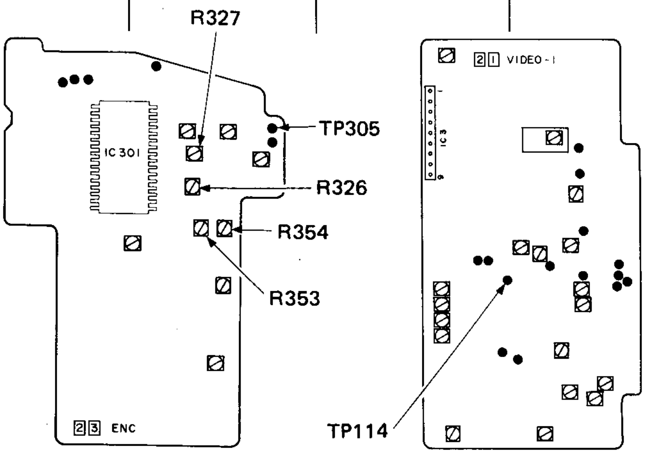

H. rate

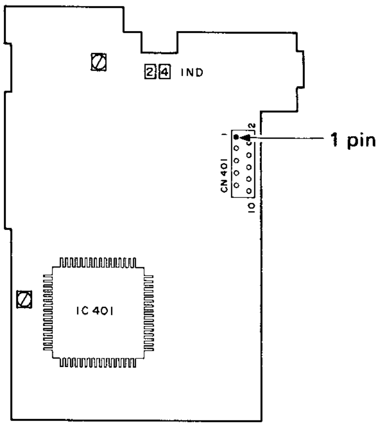

R327
IC 301
R326
R354
R353
23 ENC
21 VIDEO-1
IC3
TP114
24 IND
1 pin
CN401
IC401


cy
R
V
MG
dφ
20%
dG
YL
75%
100%
10°
0°
10°
U
B
10%
yl
G
CY
mg
R326
R327

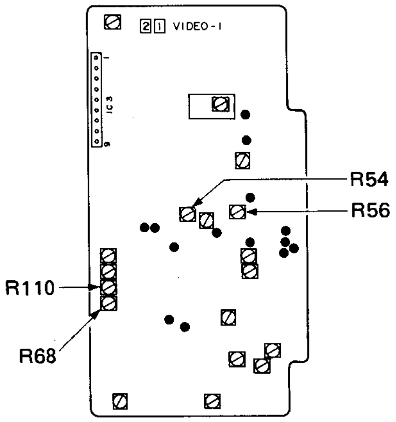
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
18 (B)	Carrier Balance	–	TP114 (P. CTL) $\boxed{2}\boxed{1}$ VIDEO-1 TP305 (C. OUT) $\boxed{2}\boxed{3}$ ENCODER	R353 (B-Y LINE SW CARR BAL) R354 (R-Y LINE SW CARR BAL) R326 (R. CARRIER BALANCE) (B. CARRIER BALANCE) $\boxed{2}\boxed{3}$ ENCODER	1) Shortcircuit between pin 1 of CN401 of $\boxed{2}\boxed{4}$ and GND with a wire. 2) Connect a wire between TP114 and GND. 3) Connect the oscilloscope to TP305 and adjust R353, R354, R326 and R327 to minimize carrier leak. 4) Disconnect the wires from GND. **Note:** After the adjustment is completed, remove the wire from CN401 pin 1 of $\boxed{2}\boxed{4}$ IND board.

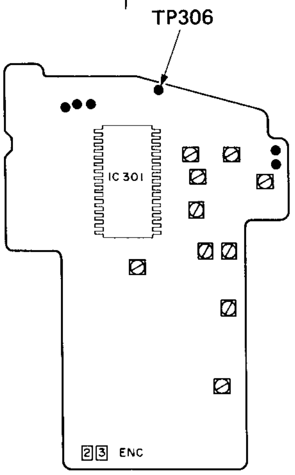


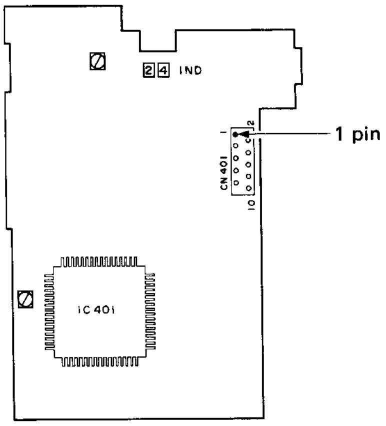

R327
TP305
R326
R354
R353
IC 301
23 ENC
21 VIDEO-1
IC3
TP114

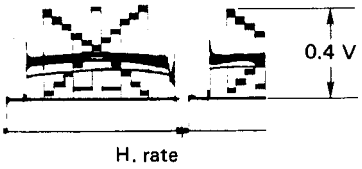

24 IND
1 pin
CN401
1
2
10
IC 401

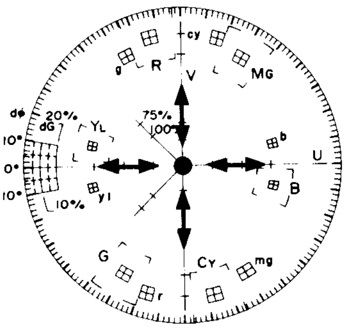
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
19 (A)	Preset Indoor	Grey scale	Vectorscope TP306 (Y OUT) [2][3]ENCODER	R68 (R SETUP) R110 (B SETUP) R54 (R LEVEL) R56 (B LEVEL) [2][1]VIDEO-1	1) Pick up the grey scale pattern. 2) Connect a wire to pin 1 of CN401 of [2][4] IND board. 3) Observing the oscilloscope connected to TP306, supply DC voltage through the wire so that signal level at TP306 becomes 0.4 V. 4) Adjust R68 and R110 so that R and B setup levels center on the vectorscope respectively. 5) Open the wired circuit. 6) Adjust R54 and R56 to center R and B signal levels on the vectorscope. 7) Repeat the above steps 3) through 6) to gain satisfactory results for each item. **Note:** After complete adjustments, remove the wire from CN401 pin 1 of [2][4] IND board.

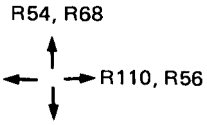

[2][1] VIDEO-1
IC3
R54
R56
R110
R68

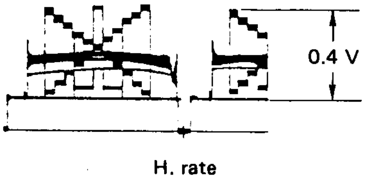
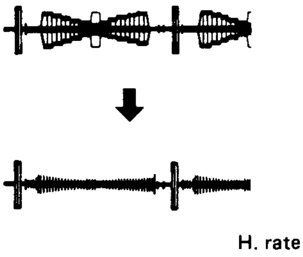

TP306
IC301
[2][3] ENC

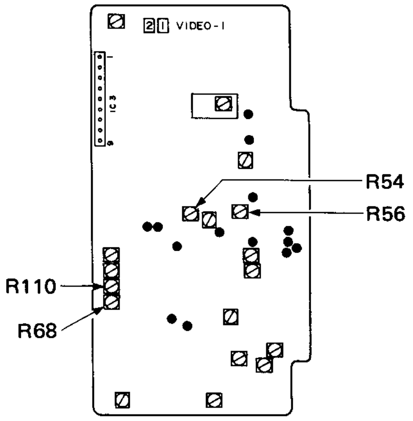

[2][4] IND
1 pin
CN401
2
10
IC401

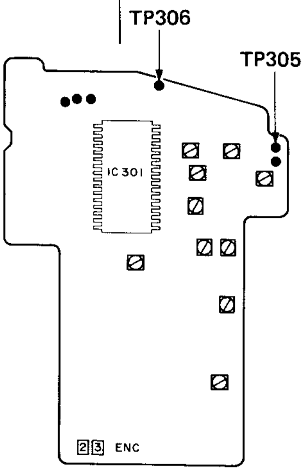


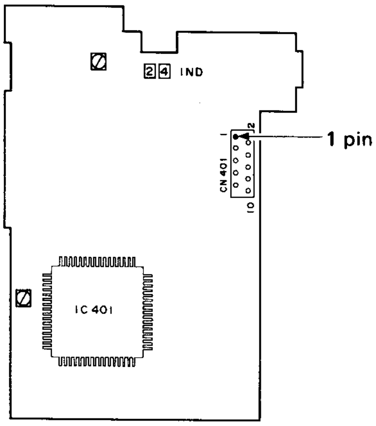

cy
R
MG
YL
U
B
G
Cy
mg
20%
10%
75%
100

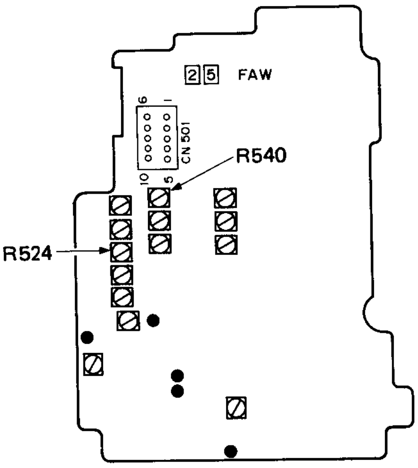
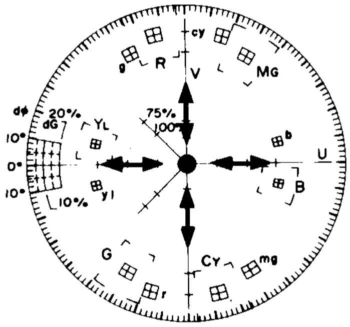
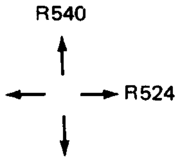
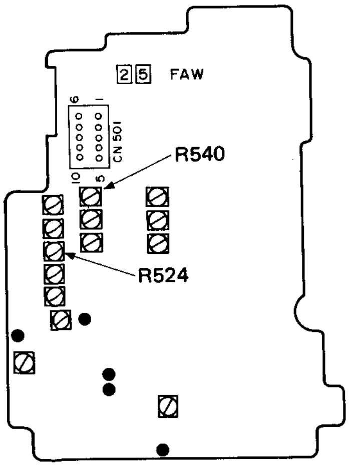
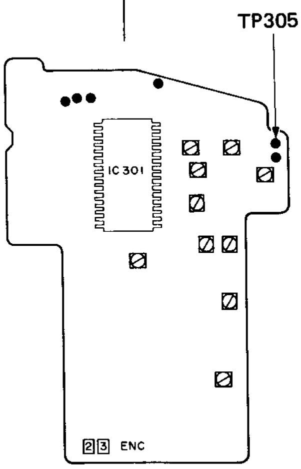
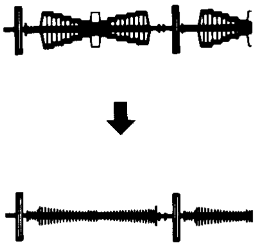

R54, R68
R110, R56

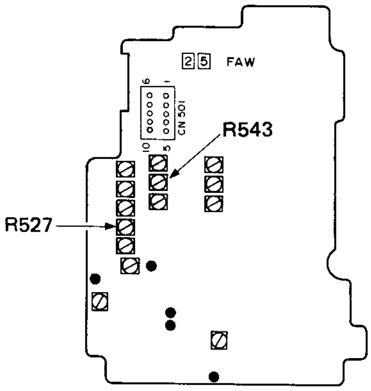
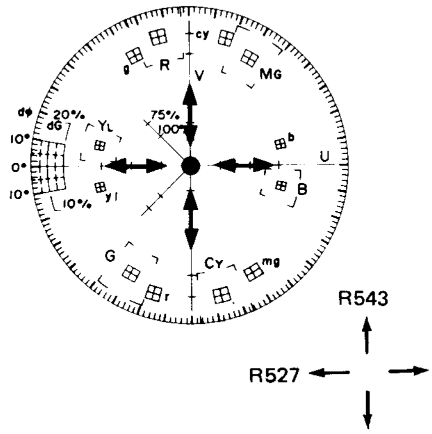
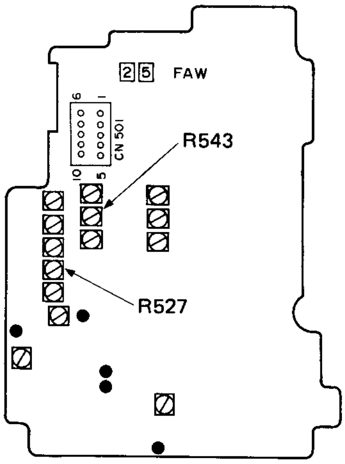
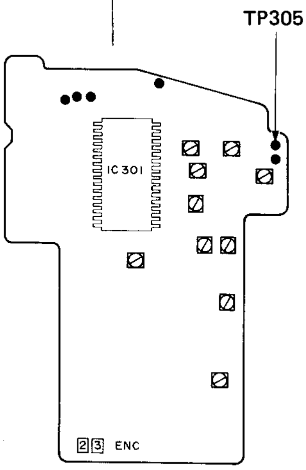
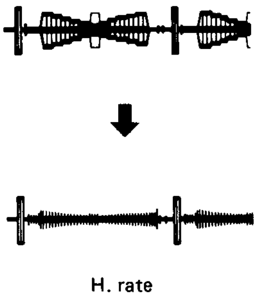
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
19 (B)	Preset Indoor	Grey scale	TP305 (C. OUT) TP306 (Y. OUT) 2 3 ENCODER	R68 (R SETUP) R110 (B SETUP) R54 (R LEVEL) R56 (B LEVEL) 2 1 VIDEO-1	1) Pick up the grey scale pattern. 2) Connect a wire to CN401 pin 1 of 2 4 IND board. 3) Observing the oscilloscope connected to TP306, supply DC voltage through the wire so that signal level at TP306 becomes 0.4 V.  4) Observing signal at TP305 with the oscilloscope, adjust R68 and R110 to minimize carrier leaks of both R and B signals. 5) Open the wired circuit. 6) Observing waveform at TP305 with the oscilloscope, adjust R54 and R56 to minimize carrier leaks of R and B levels. 7) Repeat the above steps 3) through 6) to gain satisfactory results for each item. **Note:** After completion of adjustments, remove the wire from CN401 pin 1 of 2 4 IND board. 

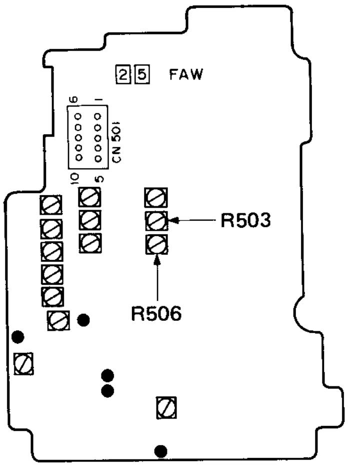
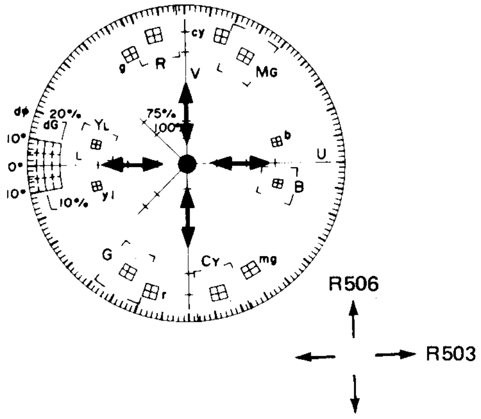
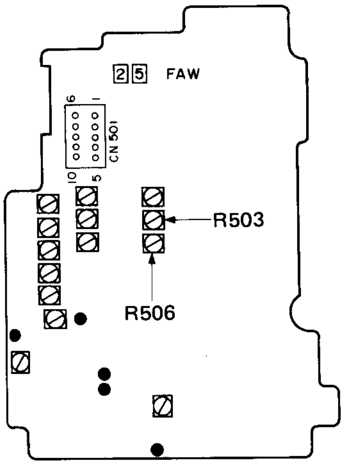
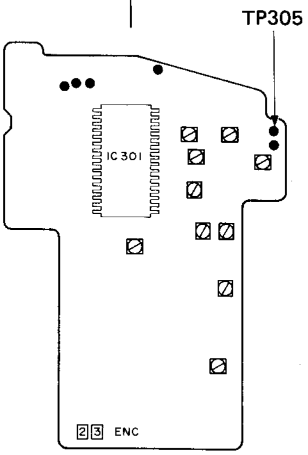
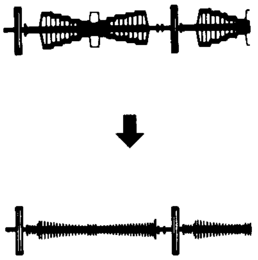


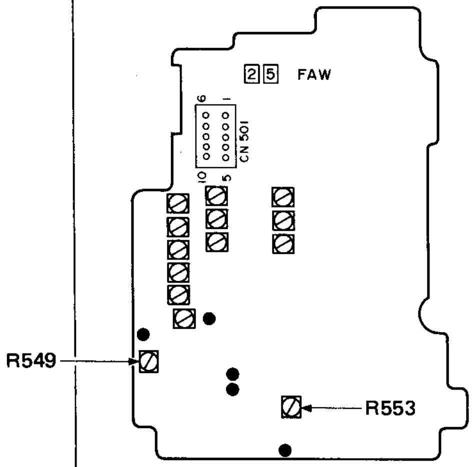
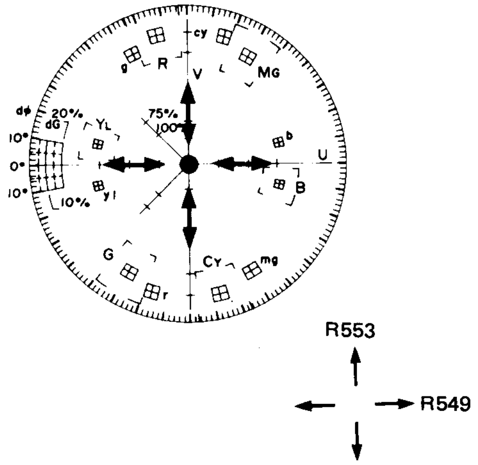
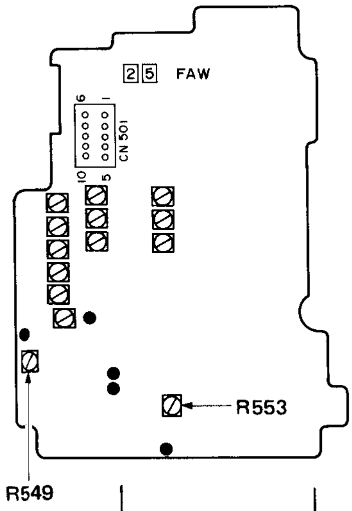
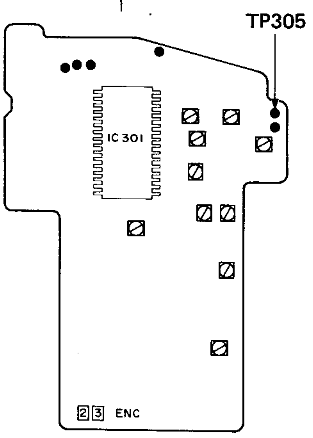
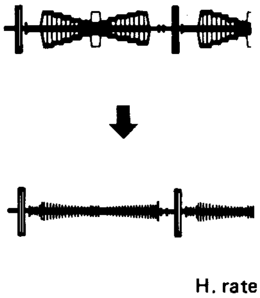


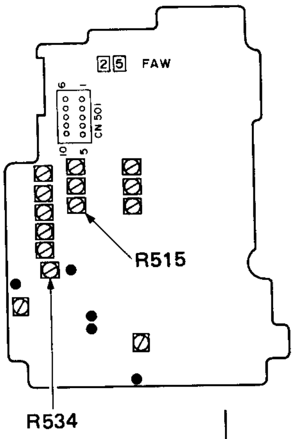
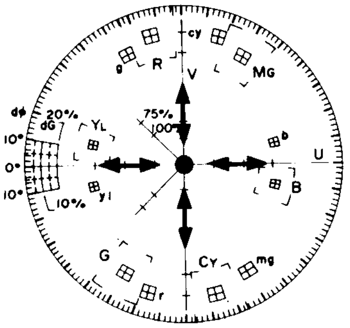
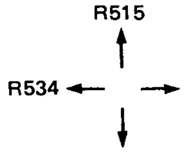
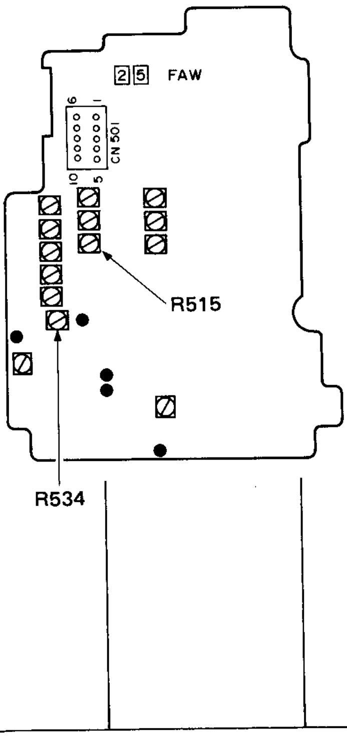
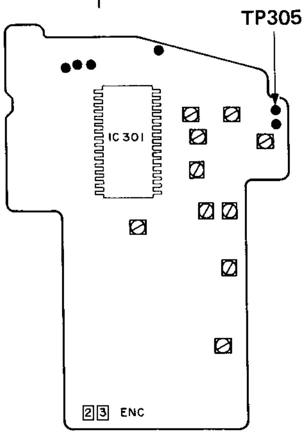
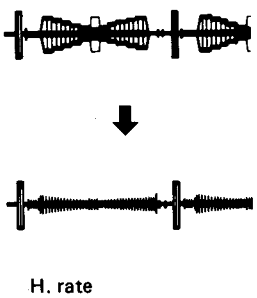


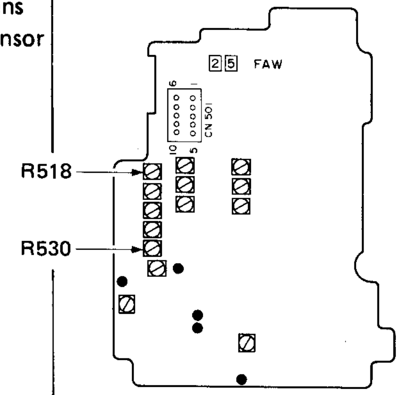
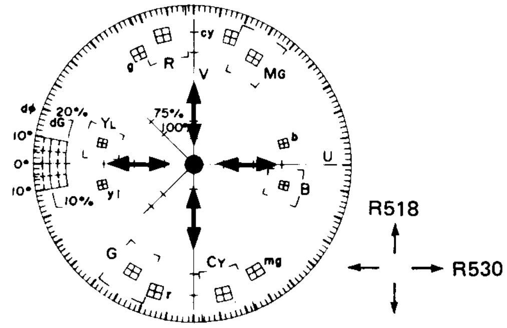
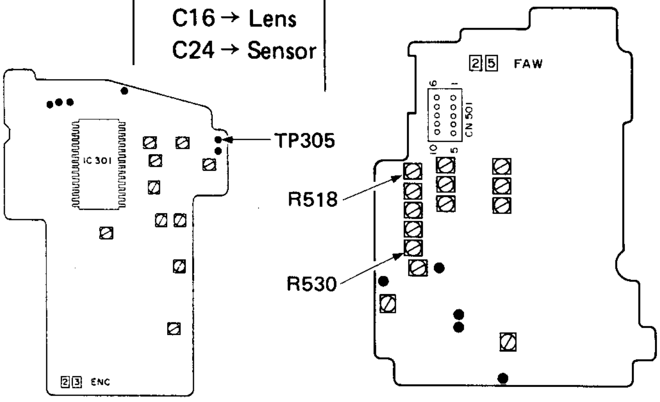
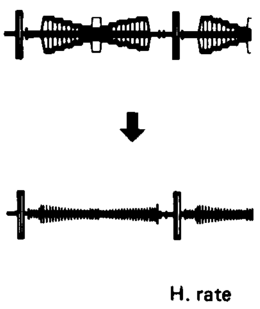
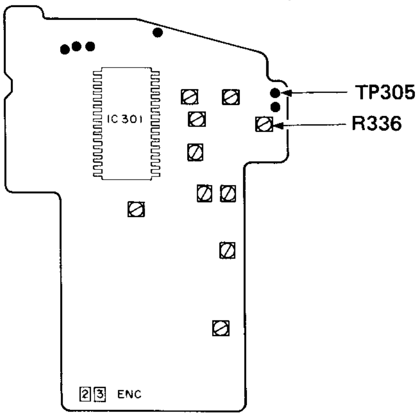
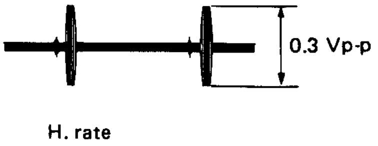
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
20 (A)	Preset FL	Grey scale W. BAL. SW: FL (Fluorescent light) mode Color temperature conversion filters (C8 + CC10Y) → Lens  $\boxed{2}\boxed{5}$ FAW CN 501 16 1 10 5 R540 R524	Vectorscope	R540 (PRESET R FL) R524 (PRESET B FL) $\boxed{2}\boxed{5}$FAW	1) With C8 + CC10Y filters attached to the lens pick up the grey scale. 2) Press the LCD WHITE BALANCE switch to set the mode for FL (fluorescent light) mode. 3) Adjust R540 and R524 alternately to position dots on the vectorscope in the center of the screen.  R MG YL B G CY U V 75% 100 20% 10% dG dφ 10° 0° 10° 
20 (B)	Preset FL	Grey scale W. BAL. SW: FL (Flourescent light) mode Color temperature conversion filters (C8 + CC10Y) → Lens  $\boxed{2}\boxed{5}$ FAW CN 501 16 1 10 5 R540 R524	TP305 (C. OUT) $\boxed{2}\boxed{3}$ENCODER  TP305 IC 301 $\boxed{2}\boxed{3}$ ENC	R540 (PRESET R FL) R524 (PRESET B FL) $\boxed{2}\boxed{5}$FAW	1) With C8 + CC10Y filters attached to the lens pick up the grey scale. 2) Press the LCD WHITE BALANCE switch to the mode for FL (fluorescent light) mode. 3) Adjust R540 and R524 alternately to minimize carrier leakage at TP305.  H. rate

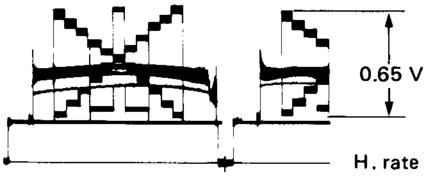
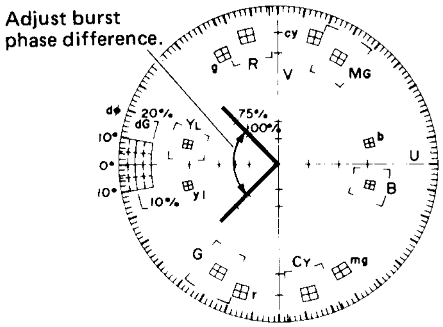
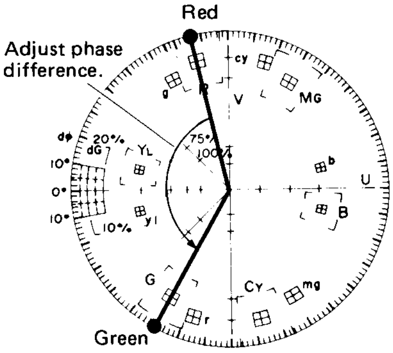
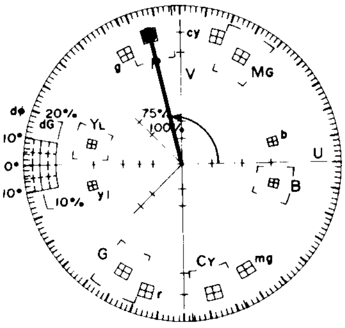
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
21 (A)	Preset Outdoor	Grey scale W. BAL. SW: OUTDOOR Color temperature conversion filter C12→ Lens  25 FAW 16 1 10 5 CN 501 R543 R527	Vectorscope	R543 (PRESET R OUTDOOR) R527 (PRESET B OUTDOOR) 25 FAW	1) With C12 filter attached to the lens, pick up the grey scale. 2) Press the LCD WHITE BALANCE switch to the mode for OUTDOOR (sunlight). 3) Adjust R543 and R527 alternately to position dots on the vectorscope in the center of the screen.  cy R V MG 20% dG YL 75% 100 10° 0° 10° U B 10% yl G CY mg R543 R527
21 (B)	Preset Outdoor	Grey scale W. BAL. SW: OUTDOOR Color temperature conversion filter C12→ Lens  25 FAW 16 1 10 5 CN 501 R543 R527	TP305 (C. OUT) 23 ENCODER  TP305 IC301 23 ENC	R543 (PRESET R OUTDOOR) R527 (PRESET B OUTDOOR) 25 FAW	1) With C12 filter attached to the lens, pick up the grey scale. 2) Press the LCD WHITE BALANCE switch to the mode for OUTDOOR (sunlight). 3) Adjust R543 and R527 alternately to minimize carrier leakage at TP305. 

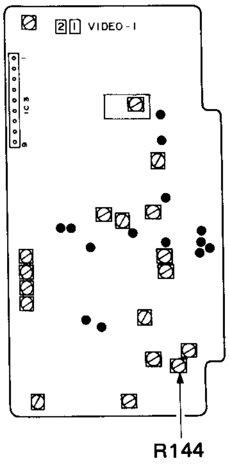
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
22 (A)	Auto White Indoor  25 FAW 16 1 CN 501 10 5 R503 R506	Grey scale W. BAL. SW: AUTO mode	Vectorscope	R503 (AW INDOOR B) R506 (AW INDOOR R) 25 FAW	1) Press the LCD WHITE BALANCE switch for AUTO mode and pick up the grey scale. 2) Adjust R503 and R506 alternately to position dots on the vectorscope in the center of the screen.  R cy V MG dφ 20% dG YL 75% 100 10° 0° 10° 10% yl b U B G CY mg r R506 R503
22 (B)	Auto White Indoor  25 FAW 16 1 CN 501 10 5 R503 R506	Grey scale W. BAL. SW: AUTO mode	TP305 (C. OUT) 23 ENCODER  TP305 IC 301 23 ENC	R503 (AW INDOOR B) R506 (AW INDOOR R) 25 FAW	1) Press the LCD WHITE BALANCE switch for the AUTO mode and pick up the grey scale. 2) Adjust R503 and R506 alternately to minimize carrier leakage at TP305.  H. rate

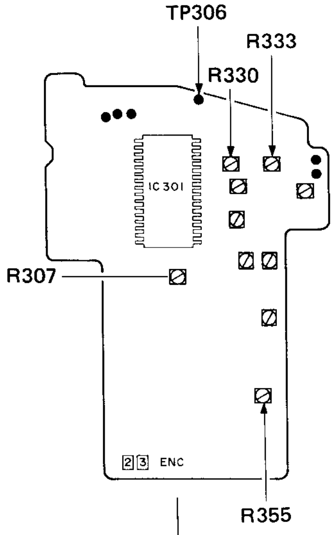
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
23 (A)	Auto White Outdoor	Grey scale W. BAL. SW: AUTO mode Color temperature conversion filters C12 → Lens & Sensor  $\boxed{2}\boxed{5}$ FAW CN 501 R549 R553	Vectorscope	R553 (AW R GAIN) R549 (AW B GAIN) $\boxed{2}\boxed{5}$ FAW	1) With C12 filters attached to the lens and the sensor, pick up the grey scale. 2) Press the LCD WHITE BALANCE switch to set the mode for AUTO. 3) Adjust R553 and R549 alternately to position dots on the vectorscope in the center of the screen. 
23 (B)	Auto White Outdoor	Grey scale W. BAL. SW: AUTO mode Color temperature conversion filters C12 → Lens & Sensor  $\boxed{2}\boxed{5}$ FAW CN 501 R553 R549	TP305 (C. OUT) $\boxed{2}\boxed{3}$ ENCODER  TP305 IC 301 $\boxed{2}\boxed{3}$ ENC	R553 (AW R GAIN) R549 (AW B GAIN) $\boxed{2}\boxed{5}$ FAW	1) With C12 filters attached to the lens and the sensor, pick up the grey scale. 2) Press the LCD WHITE BALANCE switch to set the mode for AUTO. 3) Adjust R553 and R549 alternately to minimize carrier leage at TP305. 

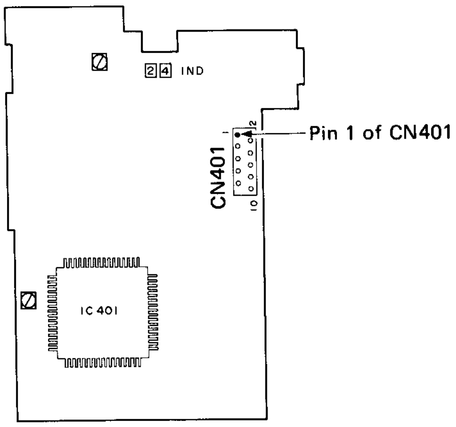
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
24 (A)	Indoor Limiter	Grey scale W. BAL. SW: AUTO mode Color temperature conversion filters W4 → Lens W14 → Sensor  2 5 FAW 16 1 10 5 CN 501 R515 R534	Vectorscope	R515 (AW R INDOOR LIM) R534 (AW B INDOOR LIM) 2 5 FAW	1) With the LCD WHITE BALANCE switch pressed to be set for AUTO mode, pick up the grey scale. 2) Attach W4 filters to the lens and W14 filter to the sensor. 3) Adjust R515 and R534 alternately to position dots on the vectorscope in the center of the screen.  cy R V MG 20% dG YL 75% 100 10° 0° 10° U B 10% G CY mg 
24 (B)	Indoor Limiter	Grey scale W. BAL. SW: AUTO mode Color temperature conversion filters W4 → Lens W14 → Sensor  2 5 FAW 16 1 10 5 CN 501 R515 R534	TP305 (C. OUT) 2 3 ENCODER  TP305 IC 301 2 3 ENC	R515 (AW R INDOOR LIM) R534 (AW B INDOOR LIM) 2 5 FAW	1) With the LCD WHITE BALANCE switch pressed to be set for AUTO mode, pick up the grey scale. 2) Attach W4 filters to the lens and W14 filter to the sensor. 3) Adjust R515 and R534 alternately to minimize carrier leakage at TP305. 

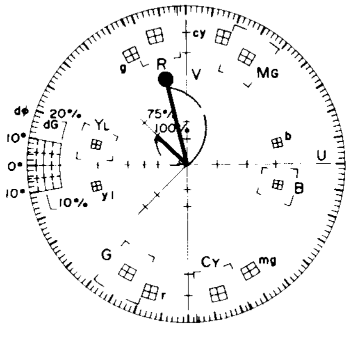
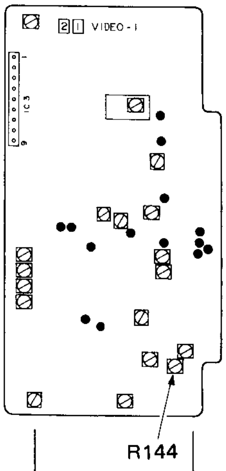
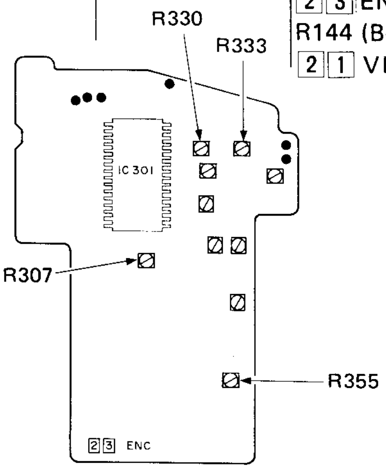
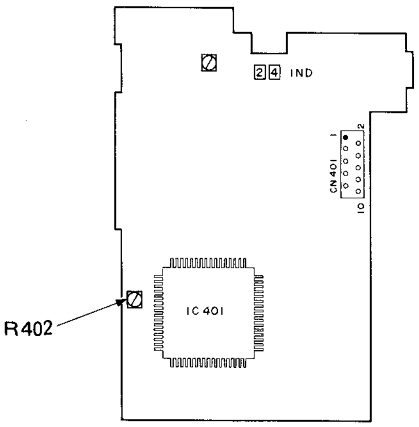
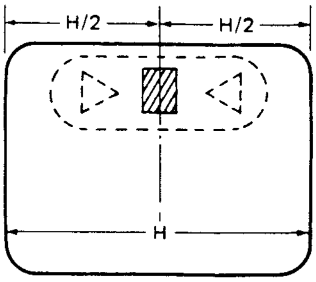
No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
25 (A)	Outdoor Limiter	Grey scale W. BAL. SW: AUTO mode Color temperature conversion filters C16 → Lens C24 → Sensor	Vectorscope	R518 (AW R OUTDOOR LIM) R530 (AW B OUTDOOR LIM) 25 FAW  25 FAW CN501 R518 R530	1) With the LCD WHITE BALANCE switch pressed to be set for AUTO mode, pick up the grey scale. 2) Attach C16 filter to the lens and C24 filter to the sensor. 3) Adjust R518 and R530 alternately to position dots on the vectorscope in the center of the screen.  R MG YL B G CY 75% 20% 10% R518 R530
25 (B)	Outdoor Limiter	Grey scale W. BAL. SW: AUTO mode Color temperature conversion filters C16 → Lens C24 → Sensor  IC301 TP305 23 ENC 25 FAW CN501 R518 R530	TP305 (C. OUT) 23 ENCODER	R518 (AW R OUTDOOR LIM) R530 (AW B OUTDOOR LIM) 25 FAW	1) With the LCD WHITE BALANCE switch pressed to be set for AUTO mode, pick up the grey scale. 2) Attach C16 filter to the lens and C24 filter to the sensor. 3) Adjust R518 and R530 alternately to minimize carrier leakage at TP305. 
26	Burst Level	Lens: Closed	TP305 (C. OUT) 23 ENCODER  IC301 TP305 R336 23 ENC	R336 (BURST LEVEL) 23 ENCODER	1) Cap the lens. 2) Adjust R336 so that color burst signal level at TP305 becomes 0.3 Vp-p.  0.3 Vp-p H. rate

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
27 (A)	Burst Phase B-Y Gain Chroma Gain Chroma Phase R-Y Phase	Color bar chart	Vectorscope TP306 (Y. OUT) [2][3] ENCODER	R307 (BURST PHASE) R333 (CHROMA GAIN) R330 (CHROMA PHASE) R355 (R-Y PHASE SHIFT) [2][3] ENCODER R144 (B-Y GAIN) [2][1] VIDEO-1	1) Connect a wire to pin 1 of CN401 of [2][4] IND board. 2) Observing signal waveform at TP306 with the oscilloscope, supply DC voltage through the wire so that luminance level of the color bar chart's white part becomes 0.65 V.  3) Adjust R307 so that burst phase difference becomes 90°.  Adjust burst phase difference. 4) Adjust R144 so that phase difference between red and green sections of the color bar chart becomes 137°.  Red Adjust phase difference. Green 5) Adjust R330, R355 so that phase of the red section of the color bar chart becomes 104°.  6) Confirm that the burst signal level is 0.3 Vp-p. If not, perform the burst gain adjustment again. (Refer to the step 26.)

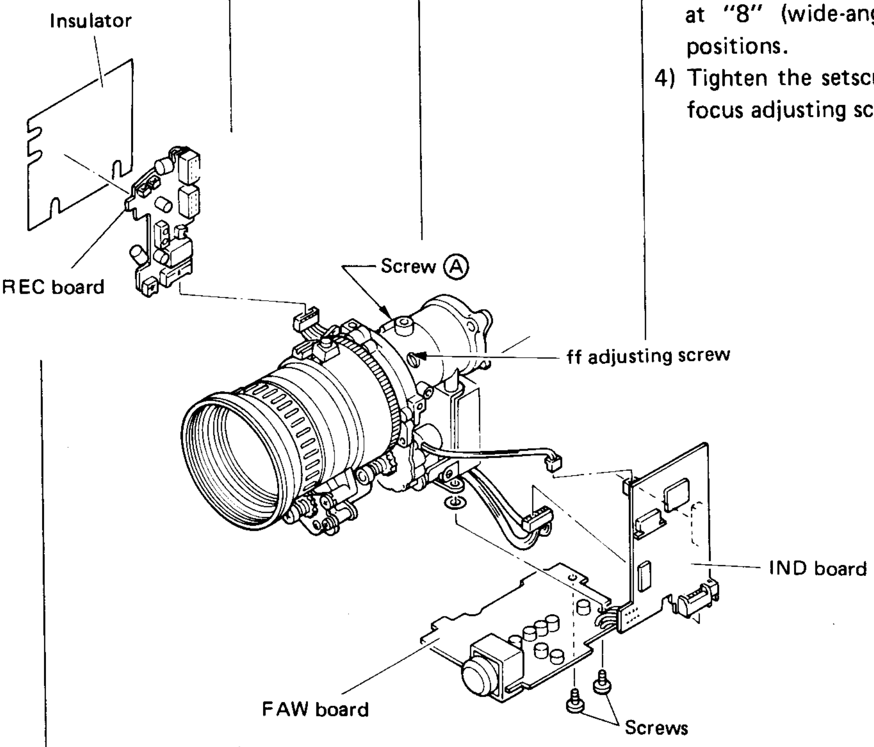

2 1 VIDEO-1
R144


TP306
R333
R330
IC301
R307
2 3 ENC
R355

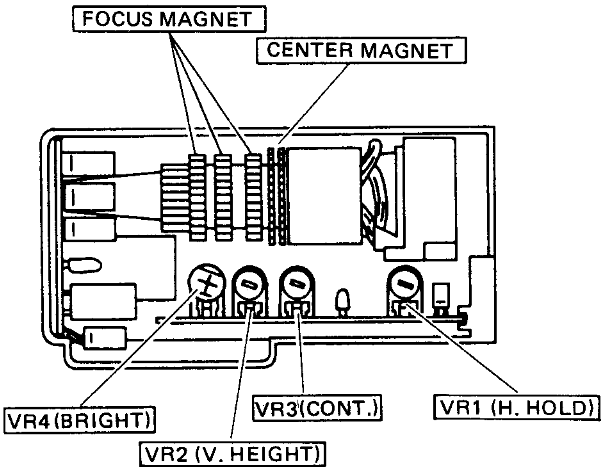
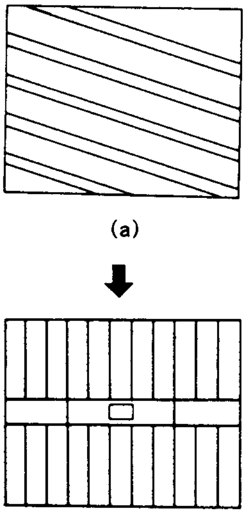

2 4 IND
Pin 1 of CN401
CN401
IC401

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
27 (A)					7) Adjust R333 so that chroma level of the red section of the color bar chart becomes 1.1 times larger than the burst level of 0.3 Vp-p.  R cy MG YL 75% 100% 20% dφ dG 10° 0° 10° 10% yl U B G CY mg r
27 (B)	Burst Phase B-Y Gain Chroma Gain Chroma Phase R-Y Phase  [2][1] VIDEO-1 IC 3 R144	Subject easy to distinguish its color phase	Monitor TV  R330 R333 IC 301 R307 R355 [2][3] ENC	R307 (BURST PHASE) R333 (CHROMA GAIN) R330 (CHROMA R355 (R-Y PHASE) [2][3] ENCODER R144 (B-Y GAIN) [2][1] VIDEO-1	**Note:** For this adjustment, it is required that color phase and color depth of a monitor TV used and the deck section have been completely adjusted. 1) Pick up a colored subject, and, observing the monitor TV, adjust R333 so that chroma level becomes of appropriate value. 2) Pick up a subject whose color phase is easily distinguished, and observing the monitor TV perform fine adjustments of R307, R144, R330 and R355 so that color tones of red, green, blue and skin tone become the most natural. **Note:** For the step 2), only fine adjustment must be made.
28	Indicator Adjust  [2][4] IND CN401 1 2 9 10 IC 401 R402	Lens closed	Electronic Viewfinder	R402 (IND OSC.) [2][4] INDICATOR	1) Adjust R402 (IND OSC) so that the indicator inside the electronic viewfinder is positioned at the center. 

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
29	Back Focus	Subject in the distance of 3 m Iris: Opened ND filter	VIDEO OUT (on Monitor)	Master Lens	● **Preparation** 1. Attach a proper ND filter to open the iris fully in the daylight. If the monitor screen is dark, the iris is fully opened. 2. If it would be still bright, attach additional ND filter(s) to cut the incident light and confirm that the brightness of the image does not vary by changing the iris set position. ● **Adjustment** 1) Loosen the setscrew Ⓐ, and slowly turn the ff adjusting screw to focus the lens observing the monitor. 2) Set the zoom lens at "48" graduation and confirm that the subject is in focus. 3) Set the lens focus at "3 m" graduation and shoot a subject in the distance of 3 m away. In this state, confirm that the picture is in focus in two ways that the zoom lens is set at "8" (wide-angle) and "48" (telephoto) positions. 4) Tighten the setscrew Ⓐ, and lock the back-focus adjusting screw.



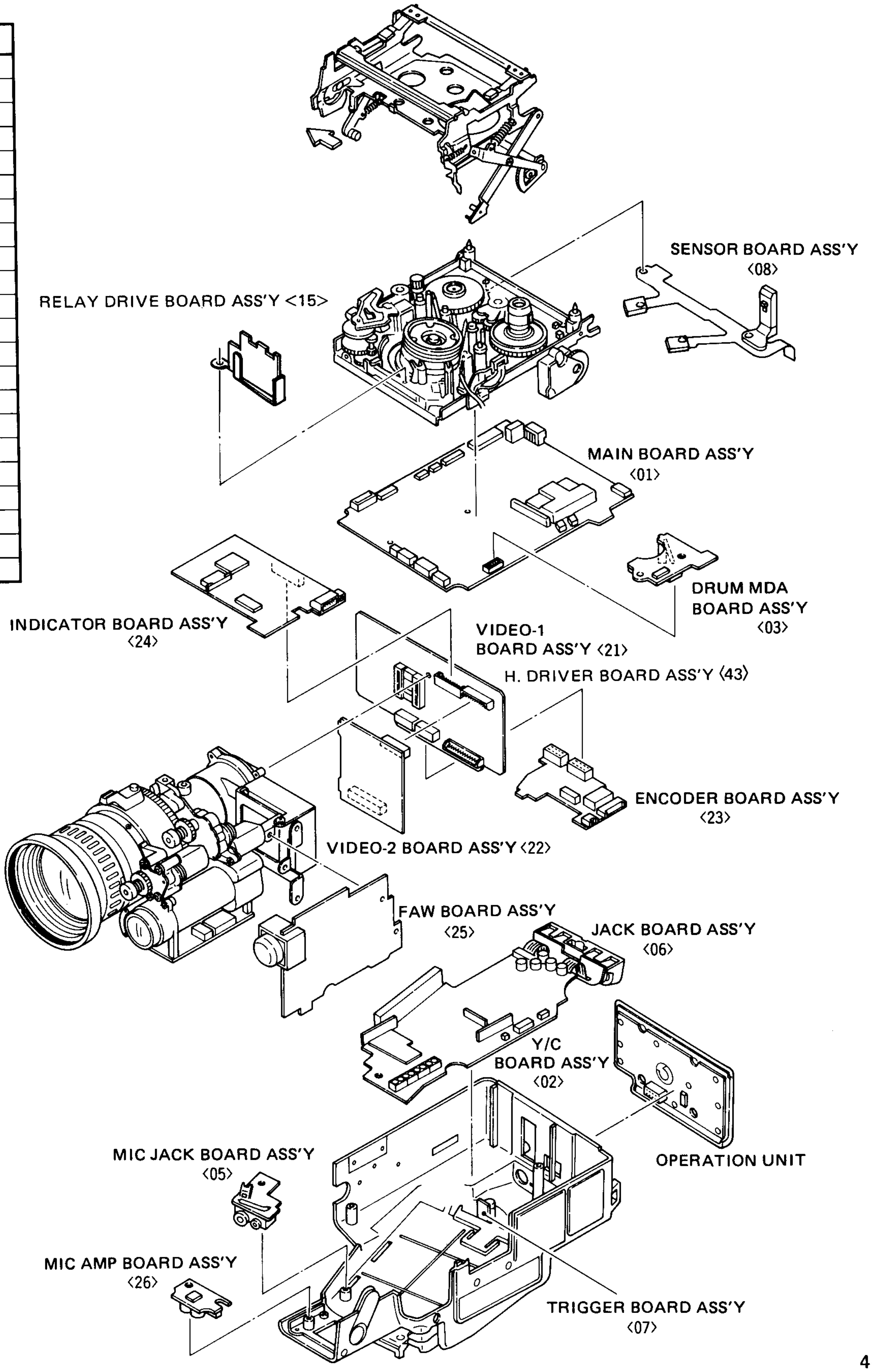
3.7 ELECTRONIC VIEWFINDER (E. VF) ADJUSTMENT

No.	Item	Signal & Mode	Check Point	Adjustment Parts	Description
1	Horizontal Sync.  FOCUS MAGNET CENTER MAGNET VR4 (BRIGHT) VR3 (CONT.) VR1 (H. HOLD) VR2 (V. HEIGHT)	Grey scale or Monoscope	E. VF (CRT)	VR1 (H. HOLD)	1) Observing the viewfinder screen, turn VR1 fully clockwise to make unstable pictures. 2) Gradually turn VR1 counterclockwise until pictures become stable. When the picture is completely stabilized, mark the VR position for future reference. 3) Turn VR1 counterclockwise again to make the picture unstable. 4) Gradually turn VR1 clockwise and stop it when the picture becomes stable again. At this time, makr the VR position, too. 5) Finally set VR1 at the midpoint between the two markings.  (a) (b) **Fig. 3-7-1**
2	Vertical Scanning	Grey scale or Monoscope	E. VF (CRT)	VR2 (V. HEIGHT)	1) Observing the viewfinder, adjust VR2 for normal picture amplitude.
3	Centering	Grey scale	E. VF (CRT)	Centering Magnet	1) Pick up the grey scale to locate it in the center of the monitor TV screen, and adjust the centering magnet so that the image of the grey scale is located in the center of the viewfinder.
4	Focus	Grey scale	E. VF (CRT)	Focus Magnet	1) Observing the viewfinder, adjust the focus magnet of the deflection yoke to obtain a clear picture of the central part of the grey scale.
5	Brightness	Iris: Closed (Lens capped)	E. VF (CRT)	VR4 (BRIGHT)	1) With the iris closed, adjust VR4 so that the CRT raster in the viewfinder is just barely visible.
6	Contrast	Grey scale	E. VF (CRT)	VR3 (CONT.)	1) Observing the viewfinder screen, adjust VR3 to obtain the best gradation of the grey scale image.

SECTION 4
DIAGRAMS AND CIRCUIT BOARDS

4.1 CIRCUIT BOARD LOCATIONS

No.	PWB NAME
01	MAIN
02	Y/C
03	DRUM MDA
05	MIC JACK
06	JACK
07	TRIGGER
08	SENSOR
15	RELAY DRIVE
21	VIDEO-1
22	VIDEO-2
23	ENCODER
24	INDICATOR
25	FAW
26	MIC AMP
43	H. DRIVER


SENSOR BOARD ASS'Y <08>
RELAY DRIVE BOARD ASS'Y <15>
MAIN BOARD ASS'Y <01>
DRUM MDA BOARD ASS'Y <03>
INDICATOR BOARD ASS'Y <24>
VIDEO-1 BOARD ASS'Y <21>
H. DRIVER BOARD ASS'Y <43>
ENCODER BOARD ASS'Y <23>
VIDEO-2 BOARD ASS'Y <22>
FAW BOARD ASS'Y <25>
JACK BOARD ASS'Y <06>
Y/C BOARD ASS'Y <02>
OPERATION UNIT
MIC JACK BOARD ASS'Y <05>
MIC AMP BOARD ASS'Y <26>
TRIGGER BOARD ASS'Y <07>

4.2 SCHEMATIC DIAGRAM NOTES

1. ▨ parts are safety related parts. When replacing them, be sure to use the specified parts.
2. Voltage and waveform measurment condition

- **DECK**

Voltage : DC-measured with a digital voltmeter during recoding (SP mode) and play back (SP-mode) with alignment tape. Where voltage differ between recoding and playback, the voltage during playback is shown in parenthese. (used to Y/C separator)

Waveform :

VIDEO System; Measured with a color bar during recording (SP mode) with alignment tape. (used to Y/C separator)

AUDIO System; Measured with 1 kHz (−8 dBs) during recoding and with alignment tape (1 kHz) during playback.

- **CAMERA**

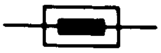
Voltage : Measured with a digital voltmeter in DC range; iris closed. (lens cap on)

Waveform : Measured as the grey scale pattern which lighted up brightly is shot in the Full-Auto mode.

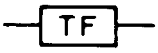
3. Unit indications

No units: [Ω]	No units: [μF]	No units : [μH]
K: [kΩ]	P: [pF]	m: [mH]
M: [MΩ]		

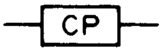
Thermistor



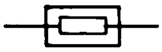
Thermal Fuse

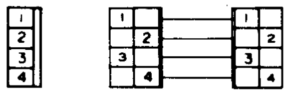


Circuit Protector

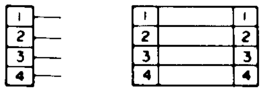


Posistor

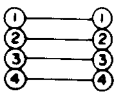




: Connector



: Board in connector



: Direct connection

COUNT UP : Active only at high.

$\overline{\text{COUNT DOWN}}$: Active only at low.

(VS) : Connected pattern in the board.

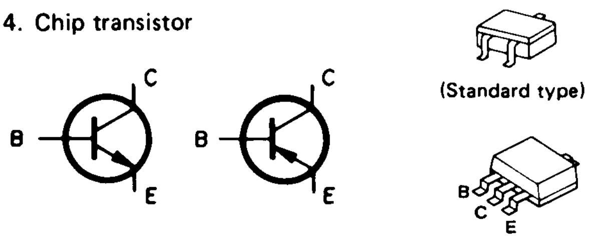
(MS) Abbreviations

(SM)

V : Video	M : Mechacon
S : Servo	A : Audio

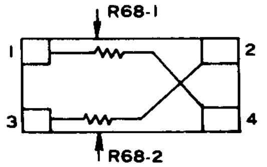
VS : Signal flow from video to servo.

4. Chip transistor



5. Double chip resistors

These devices contain two resistance elements of differing values. In the example shown in the figure, R68 is comprised of R68-1 between terminals 1 and 4, and R68-2 between terminals 2 and 3.



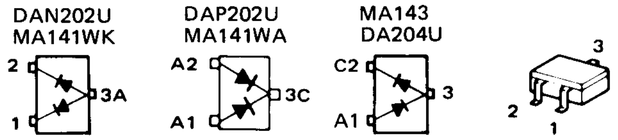
R68 PU59735-472Y103

472 indicates 4.7 kΩ for R68-1

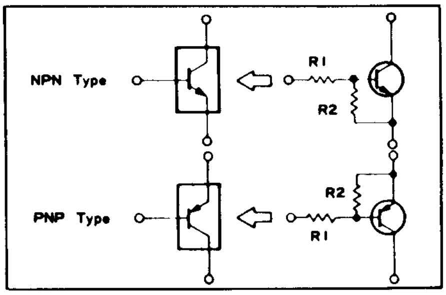
103 indicates 10 kΩ for R68-2

As can be noted from the figure, left-right reversal of the device does not change the connection values. However, turning the device upside-down will result in incorrect connectin.

6. Chip diode



7. Digital transistor



RESISTOR VALUES

JUNCTION	Part No.	R1 (kΩ)	R2 (kΩ)
PNP	DTA124EU	22	22
NPN	DTC144EU DTC124EU	47 22	47 22

Note: The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.

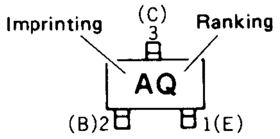
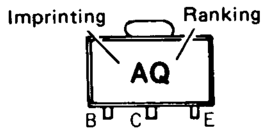
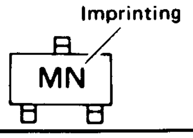
USES: INVERTER, INTERFACE, DRIVER CIRCUITS.

4.3 REPLACING SUBMINIATURE "CHIP" PARTS

1. Some resistors, shorting jumpers (0 Ω resistance), ceramic capacitors, transistors, and diodes are chip parts. These chip parts cannot be reused after they are once removed.
2. Additional compactness is achieved by using subminiature chip parts for certain circuit elements. When replacing these parts, note the cautions outlined below.

   Chip transistors and diodes used in this model are outlined as follows.

- **Chip transistor and chip diode imprinting**

Transistors				Diodes	
Type	Imprinting	Type	Imprinting	Type	Imprinting
DTA124EU	15	2SB798	DM, DL, DK	DAN202U	N
DTC124EU	25	2SC2412K(S)	BS	DAP202U	P
DTC144EU	26	2SC3931	UB~UD	DA204U	D14
DTC144WU	86	2SC3936(BC)	KB, KC	FMN1	N1
FMC2	C2	2SC4081	BQ~QS	IMN10	N10
FMG1	G1	2SC4098(PQ)	AP, AQ	MA141WA	MN
FMG2	G2	2SC4099(NP)	JN, JP	MA141WK	MT
FMU1	U1	2SC4176	B33, B34, B35	MA143	MC
FMW1	W1	2SC4177(56)	L5, L6	MA3075H	7.5H
FMW3	W3	2SC4178(34)	F13, F14	MA704	MIK
2SA1036K	HP~HR	2SD1819	YQ~YS	MA716	M1U
2SA1532(BC)	EB, EC	2SJ146	4D	RD7.5M-T1B2	752
2SA1576	FQ, FR	2SK198P,Q	10P, 10Q	RD7.5MB3	753
2SA1610	Y33, Y34	2SK620	3N	RD8.2MB2	822
2SA1611(56)	M5, M6	2SK665	30		
2SB1218(RS)	AR, AS	3SK179	V03		
2SB624	BV4, BV5				
					

Note ; ( ) refers to Transistor rank.

3. Required tools:
   1) Fine tipped, well insulated soldering "pencil" (with absorbent) (Temp : 130°C ~ 260°C).
   2) Tweezers
   3) Blower type hair dryer.
4. Soldering cautions:
   1) Do not apply heat for more than 3 seconds.
   2) Avoid using a rubbing stroke when soldering.
   3) Discard removed chips; do not reuse them.
   4) Supplementary cementing is not required.
   5) Use care not to scratch or otherwise damage the chips.
5. Soldering conditions:
   1) Resistors, capacitors, etc.

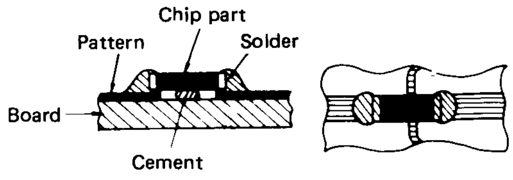


Fig. 4-1

2) Transistors, diodes, etc.

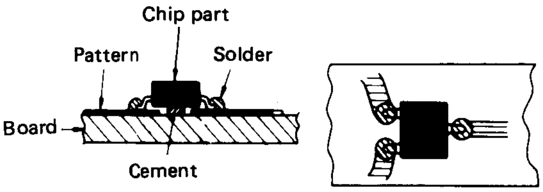


Fig. 4-2

6. Removal (resistors, capacitors, etc.):
   1) Grasp the part with repair jig and melt the solder at one side.

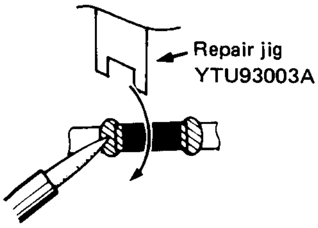


Fig. 4-3

   2) Melt the solder at the other side and remove the part with a twisting motion.

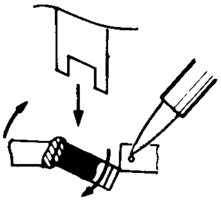


Fig. 4-4

7. Removal (transistors, diodes, etc.):
   1) Melt the solder of one lead.

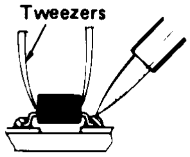


Fig. 4-5

   2) Lift the side of that lead upward.

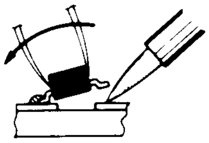


Fig. 4-6

   3) Simultaneously heat solder of the two remaining leads and lift part to remove.

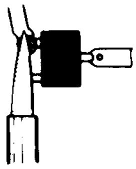


Fig. 4-7

8. Preheating (except for semiconductors):
   Immediately before installing new resistors or capacitors, use a blower type hair dryer and preheat the part for about two minutes at approximately 150°C.

9. Replacement:
   1) Presolder the contact points of the circuit pattern.

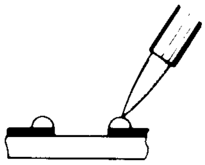


Fig. 4-8

   2) Press the part downward with repair jig and apply the soldering pencil as indicated in the figure.

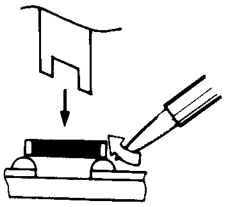


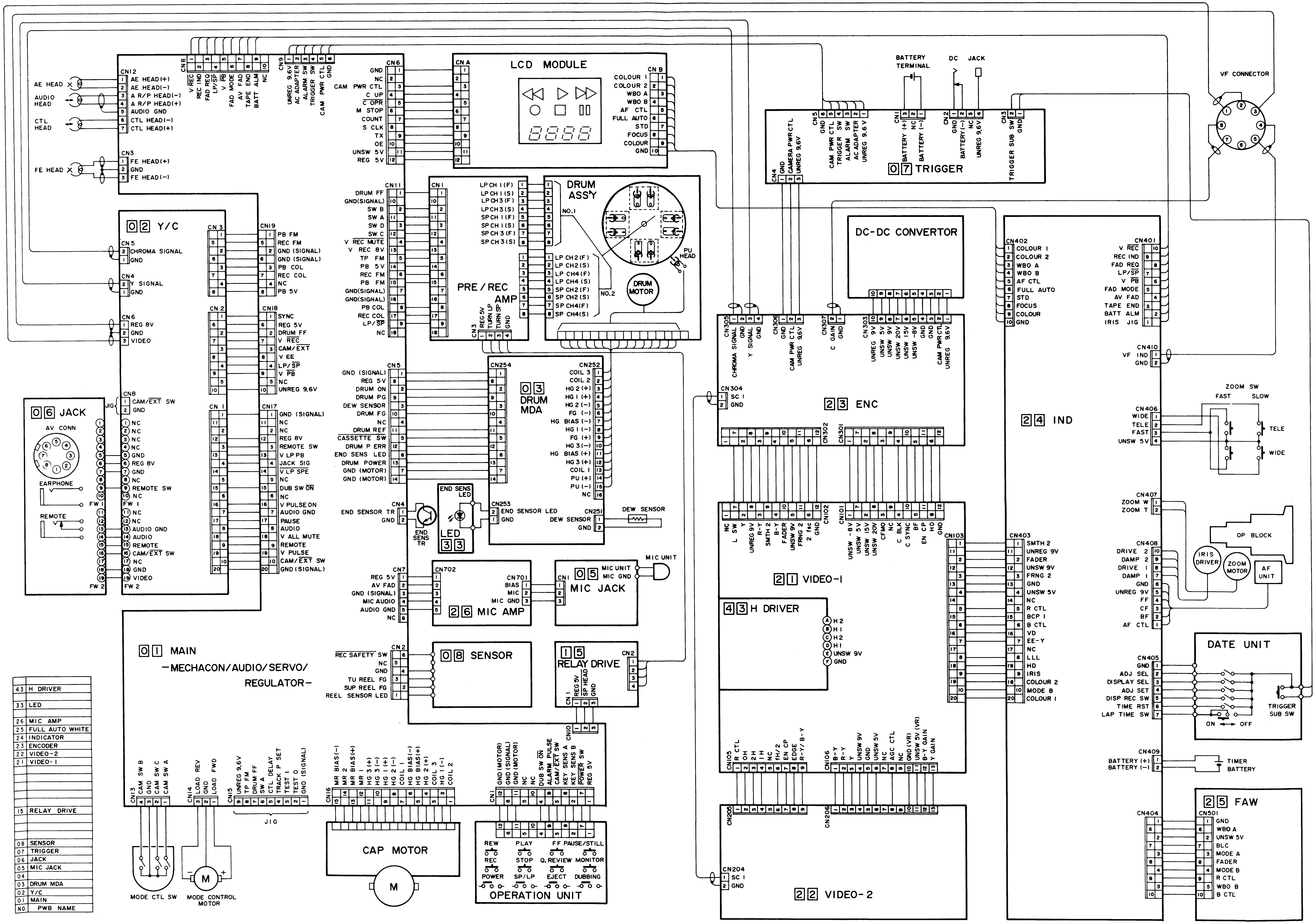
Fig. 4-9

4.4 KEY TO ABBREVIATIONS

A	AC	: Alternating Current
	ACC	: Automatic Color Control
	A/CTL	: Audio/Control
	ADC	: Analog to Digital Converter
	ADD	: Adder
	ADJ	: Adjustment
	AE	: Audio Erase
	AEF	: Automatic Editing Function
	AF	**: Auto Focus**
	AFC	: Automatic Frequency Control
	AFT	: Automatic Fine Tuning
	AGC	: Automatic Gain Control
	AH	: Audio Head
	AL	**: After Loading, Allways**
	ALC	: Automatic Light Compensation Automatic Level Control
	ALM	: Alarm
	ALU	: Arithmetic Logic Unit
	AM	: Amplitude Modulation
	AMP	: Amplifier
	ANT	: Antenna
	APC	: Automatic Pedestal Control Automatic Phase Control
	APL	: Average Picture Level
	A/S/M	: Audio/Servo/Mechacon
	ASS'Y	: Assembly
	ATT	: Attenuator
	AUD	: Audio
	AUTO	: Automatic
	AUX	: Auxiliary
B	B	**: Base, Blue**
	BAL	: Balance
	BATT	: Battery
	BBD	: Bucket Brigade Device
	BCD	: Binary Coded Decimal
	BEG	: Beginning
	BF	**: Behind Focus**
	BFP	: Burst Flag Pulse
	BPF	**: Band Pass Filter**
	BIT	: Binary Digit
	BLK	: Black, Blanking
	BLU	: Blue
	BNC	: Bayonet Connector
	BOT	: Beginning of Tape
	BPF	: Bandpass Filter
	BRK	: Brake
	BRN	: Brown
	BRT	: Brightness
	BT	: Band Tuning
	BUFF	: Buffer
	BW or B/W	: Black and White
C	C	**: Capacitance, Collector, Color, Character**
	CA	**: Camera**
	CAL	: Calibration
	CAP	: Capstan, Capacitor
	CAR	: Carrier
	CARR	: Carrier
	CASS	: Cassette
	CC	: Cassette Compartment
	CCD	: Charge Coupled Device
	CCT	: Circuit
	CdS	: Cadmium Sulphide
	CD	: Count Down
	CE	: Chip Enable
	CF	**: Ceramic Filter, Color Frame, Correct Focus**
	CH	: Channel
	CHG	: Charge
	CHROMA	: Chrominance
	CLK	: Clock
	CLR	: Clear
	CMD	: Command
	CMOS	: Complementary Metal Oxide Semiconductor
	CNT	: Count, Counter
	COL	: Color
	COM	: Common
	COMB	: Combination Comb Filter
	COMP	: Comparator Composite Compensation
	CONN	: Connector
	CONV	: Converter
	CP	: Circuit Protector Clamp Pulse
	CPC	: Capstan Phase Control
	CPU	: Central Processing Unit
	CTC	: Crosstalk Cancel
	CTL	: Control
D	D	: Drum, Digital, Diode, Drain
	DAC	: Digital to Analog Converter
	dB	: Decibel
	DC	: Direct Current
	DD	: Direct Drive
	DEC	: Decoder
	DEMOD	: Demodulator
	DEMUX	: Demultiplexer
	DET	: Detector
	DEV	: Deviation
	DFRS	: Drum Free Running Stop
	DG	: Differential Gain
	DIF	: Differential
	DISCR	: Discriminator
	DL	: Delay Line
	DOC	: Dropout Compensator
	DOD	: Drop Out Detector
	DP	: Differential Phase
	DPC	: Drum Phase Control
	DYAC	: Dynamic Aperture Control
E	E	: Edit, Emitter
	EDP	: Electronic Data Processing
	E-E	: Electric to Electric
	EF	: Emitter-Follower
	EMP	: Emphasis
	EN	: Enable
	ENC	: Encoder
	ENV	: Envelope
	EOT	: End of Tape
	EP	: Extended Play
	EQ	: Equalizer
	ES	: Electronic Switch
	ESNS	: End Sensor
	EXP	: Expander
	EXT	: External
F	F	: Farad, Fuse
	F ADV	: Frame Advance
	FDP	: Fluorescent Display Panel
	FE	: Full Erase
	FET	: Field Effect Transistor
	FF	**: Fast Forward, Front Focus** Flipflop
	FG	: Frequency Generator
	FM	: Frequency Modulation
	FR	: Full Recording, Frame, Fusible Resistor
	FREQ	: Frequency
	F-V CONV	: Frequency to Voltage Converter
	FWD	: Forward
	FWD S	: Forward Search
G	G	: Green, Gate, Grid
	GEN	: Generator
	GND	: Ground
	GRN	: Green
	GRY	: Gray
H	H	: High, Henry, Hour
	HBF	: Horizontal Burst Flag
	HD	: Horizontal Drive
	HPF	: Highpass Filter
	Hz	: Herz

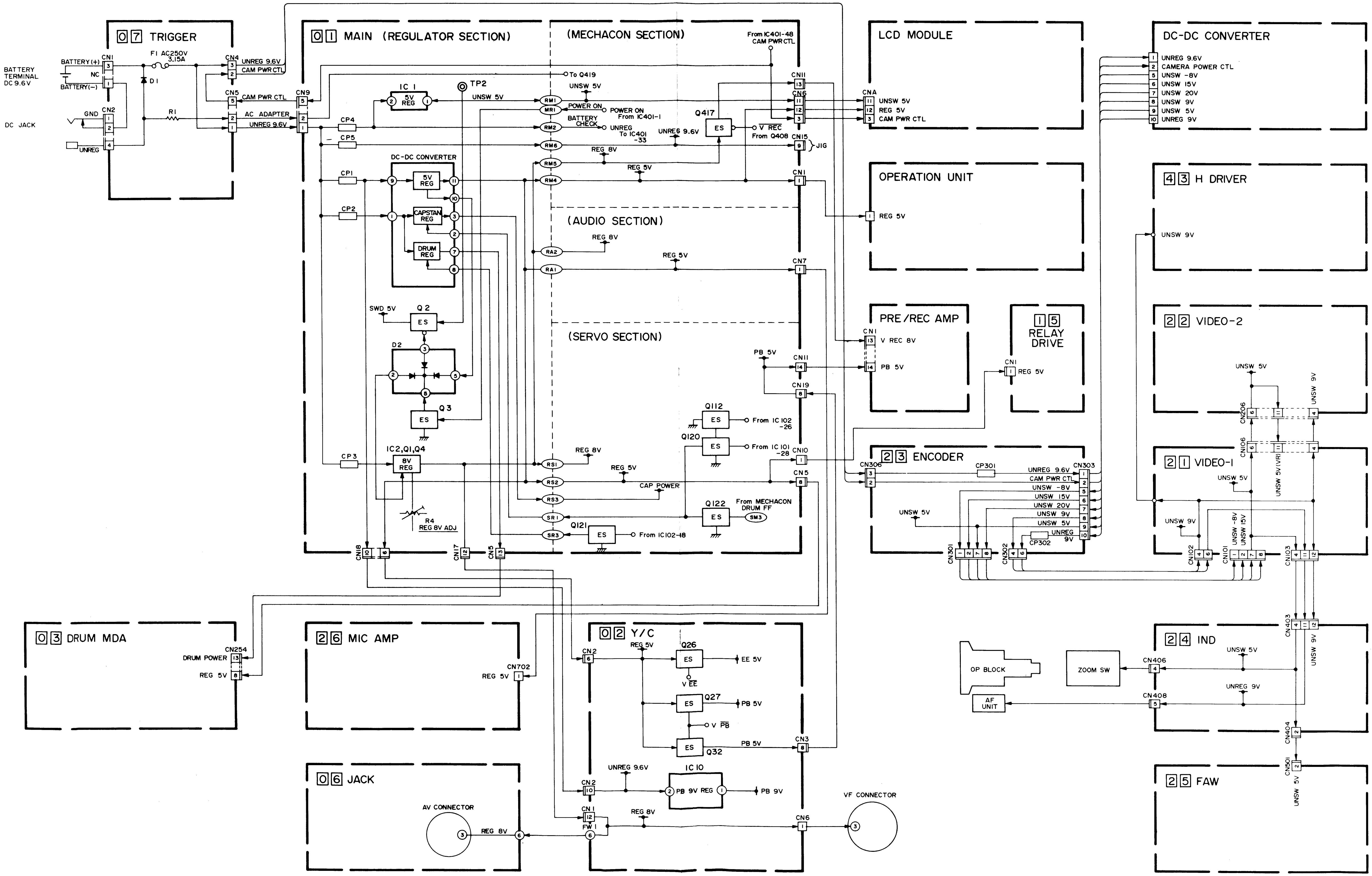
I	IC	Integrated Circuit
	ID	Identification (Pulse)
	IF	Intermediate Frequency
	IFR	Infrared
	IFT	Intermediate Frequency Transformer
	IND	Indicator
	INH	Inhibit
	INS	Insert
	INT	Internal, Interrupt
	INV	Inverter, Interleave
	I/O	Input/Output
	IR	Infrared
L	L	Low, Left
	LCD	Liquid Crystal Display
	LED	Light Emitting Diode
	LIM	Limiter
	LIN	Linearity
	LLD	Low Light Detector
	LOAD	Loading (Cassette)
	LP	Long Play
	LPF	Lowpass Filter
	LSB	Lower Sideband
M	M	Motor, Mega
	MAX	Maximum
	MDA	Motor Drive Amplifier
	MECHACON	Mechanism Control
	MIC	Microphone
	MIN	Minimum
	MIX	Mixer, Mixing
	MMV	Monostable Multivibrator
	MNOS	Metal Nitride Oxide Semiconductor
	MOD	Modulation, Modulator
	MODEM	Modulator-Demodulator
	MON	Monitor
	MOS	Metal Oxide Semiconductor
	MPX	Multiplexer, Multiplex
	MS	Mode Select
	MUT	Muting
N	NAND	Not-And
	NC	Not Connected, Normally Closed
	NFB	Negative Feedback
	NLN	Non-Linear
	NO	Normally Open
	NOR	Normal, Not-Or
	NR	Noise Reduction
O	OP	Operation
	OPAMP	Operational Amplifier
	ORG	Orange
	OSC	Oscillator
P	PB	Playback
	PC	Photocoupler, Pulse Counter
	PCM	Pulse Code Modulation
	PG	Pulse Generator
	PGM	Program
	PI	Photo Interrupter
	PIC	Picture Control
	PIF	Picture Intermediate Frequency
	PLA	Programmable Logic Array
	PLL	Phase Locked Loop
	PNK	Pink
	POS	Position
	p-p	Peak-to-Peak
	PR	Pinch Roller
	PREAMP	Preamplifier
	PRL	Preroll
	P/S	Pause/Still
	PSC	Pulse Swallowing Control
	PU	Pickup
	PUT	Programmable Unijunction Transistor
	PWB	Printed Wiring Board
	PWM	Pulse Width Modulation
	PWR	Power
Q	Q	Quality Factor
R	R	Red, Right
	RA	Resistor Array
	RAM	Random Access Memory
	REC	Recording
	REF	Reference
	REG	Regulated, Regulator
	REM	Remote
	REMOCON	Remote Control (Unit)
	REV	Reverse
	REV S	Reverse Search
	REW	Rewind
	RF	Radio Frequency
	ROM	Read Only Memory
	R/P	Record/Playback
	RPT	Repeat
	RS FF	RS Flipflop
	RST	Reset
	RT	Rotary Transformer
	RUN	Running
	RY	Relay
S	SAW	Sawtooth, Surface Acoustic Wave
	SC	Subcarrier, Simulcast
	SCH	Search
	SEL	Select, Selector
	SENS	Sensor
	SEP	Separator
	SF	Source Follower
	SFF	Short Fast Forward
	SIF	Sound Intermediate Frequency
	SN	Signal to Noise Ratio
	SOL	Solenoid
	SOS	Sound on Sound
	SP	Standard Play
	SR	Supply Reel
	SREW	Short Rewind
	S/S	Slow/Still
	SSG	Sync Signal Generator
	SSNS	Start Sensor
	STD	Strobe Data, Standard
	SUP	Supply
	SW	Switch
	SWD	Switched
	SYNC	Synchronization
T	TAL	Tally
	TBC	Time Base Corrector
	TC	Tension Control, Time Code
	TEN	Tension
	TF	Thermal Fuse
	TIM	Timing
	TK	Tracking
	TNR	Tuner
	TP	Test Point
	TPZD	Trapezoid
	TR	Transistor, Trimmer
	TRANS	Transformer
	TU	Take-up
U	UL	Unloading
	UNREG	Unregulated
	UNSW	Unswitched
V	V	Vertical, Volt
	VACT	Video Action
	VCO	Voltage Controlled Oscillator
	VD	Vertical Drive
	VIF	Video Intermediate Frequency
	VLT	Violet
	VR	Variable Resistor
	VS	Video and Sync
	VSCH	Variable Search
	VV	Video to Video
	VXO	Variable Crystal Oscillator
W	W	Watt
	WARN	Warning
	W & D	White and Dark
	WHT	White
	WV	Working Voltage
X	XTAL	Crystal
Y	Y	Luminance
	YEL	Yellow

4.5 OVERALL WIRING

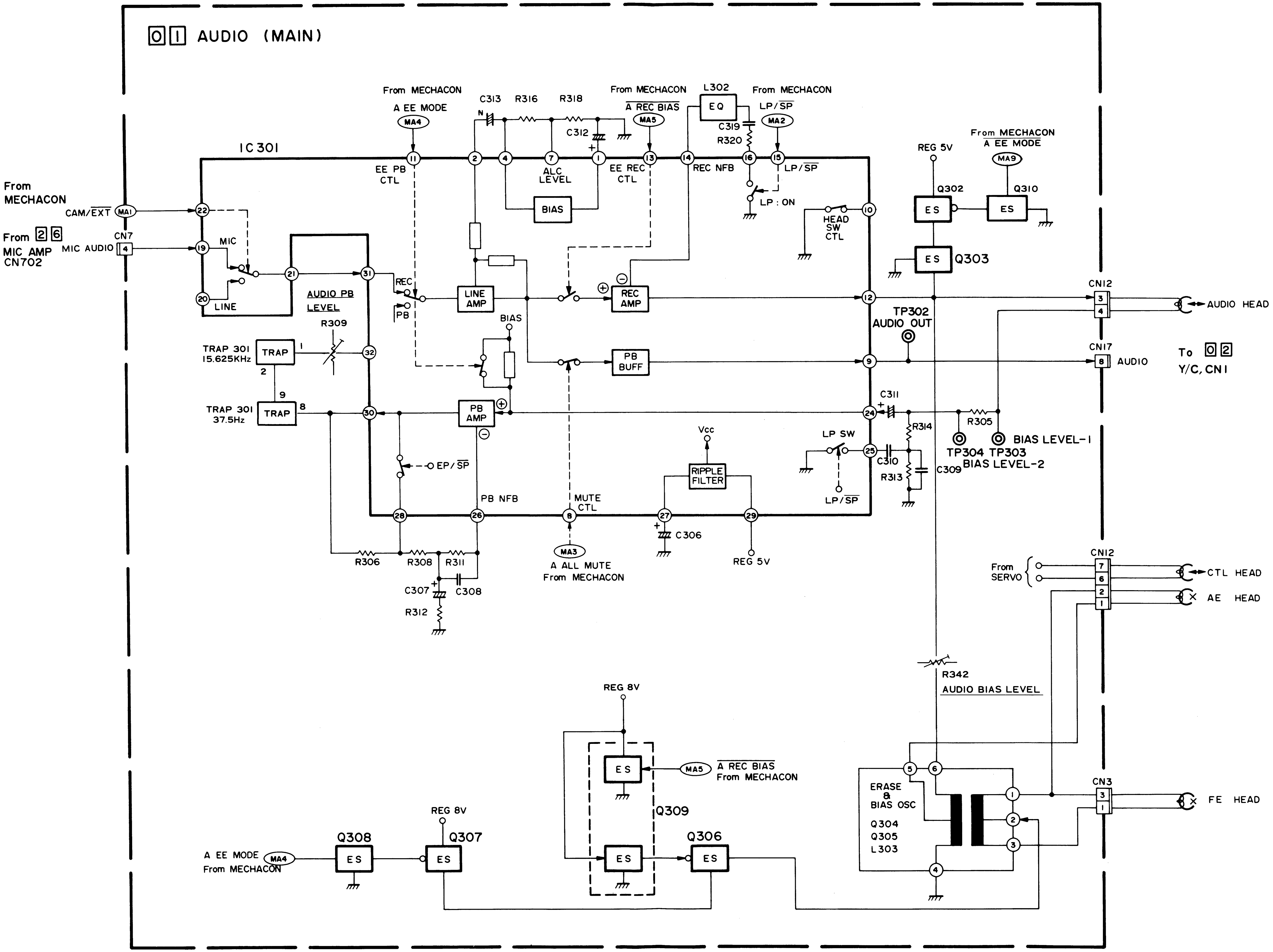

01 MAIN
-MECHACON/AUDIO/SERVO/
REGULATOR-
02 Y/C
03 DRUM MDA
05 MIC JACK
06 JACK
07 TRIGGER
08 SENSOR
15 RELAY DRIVE
21 VIDEO-1
22 VIDEO-2
23 ENC
24 IND
25 FAW
26 MIC AMP
33 LED
43 H DRIVER
LCD MODULE
PRE / REC AMP
DRUM ASS'Y
DRUM MOTOR
DC-DC CONVERTOR
DATE UNIT
OPERATION UNIT
CAP MOTOR
MODE CTL SW
MODE CONTROL MOTOR
AE HEAD
AUDIO HEAD
CTL HEAD
FE HEAD
PU HEAD
AV CONN
EARPHONE
REMOTE
BATTERY TERMINAL
DC JACK
VF CONNECTOR
ZOOM SW
FAST
SLOW
TELE
WIDE
OP BLOCK
IRIS DRIVER
ZOOM MOTOR
AF UNIT
MIC UNIT
DEW SENSOR
END SENS TR
TIMER BATTERY
TRIGGER SUB SW
ON
OFF
REW
PLAY
FF
PAUSE/STILL
REC
STOP
Q.REVIEW
MONITOR
POWER
SP/LP
EJECT
DUBBING
JIG

NO.	PWB NAME
43	H DRIVER
33	LED
26	MIC AMP
25	FULL AUTO WHITE
24	INDICATOR
23	ENCODER
22	VIDEO-2
21	VIDEO-1
15	RELAY DRIVE
08	SENSOR
07	TRIGGER
06	JACK
05	MIC JACK
04	
03	DRUM MDA
02	Y/C
01	MAIN

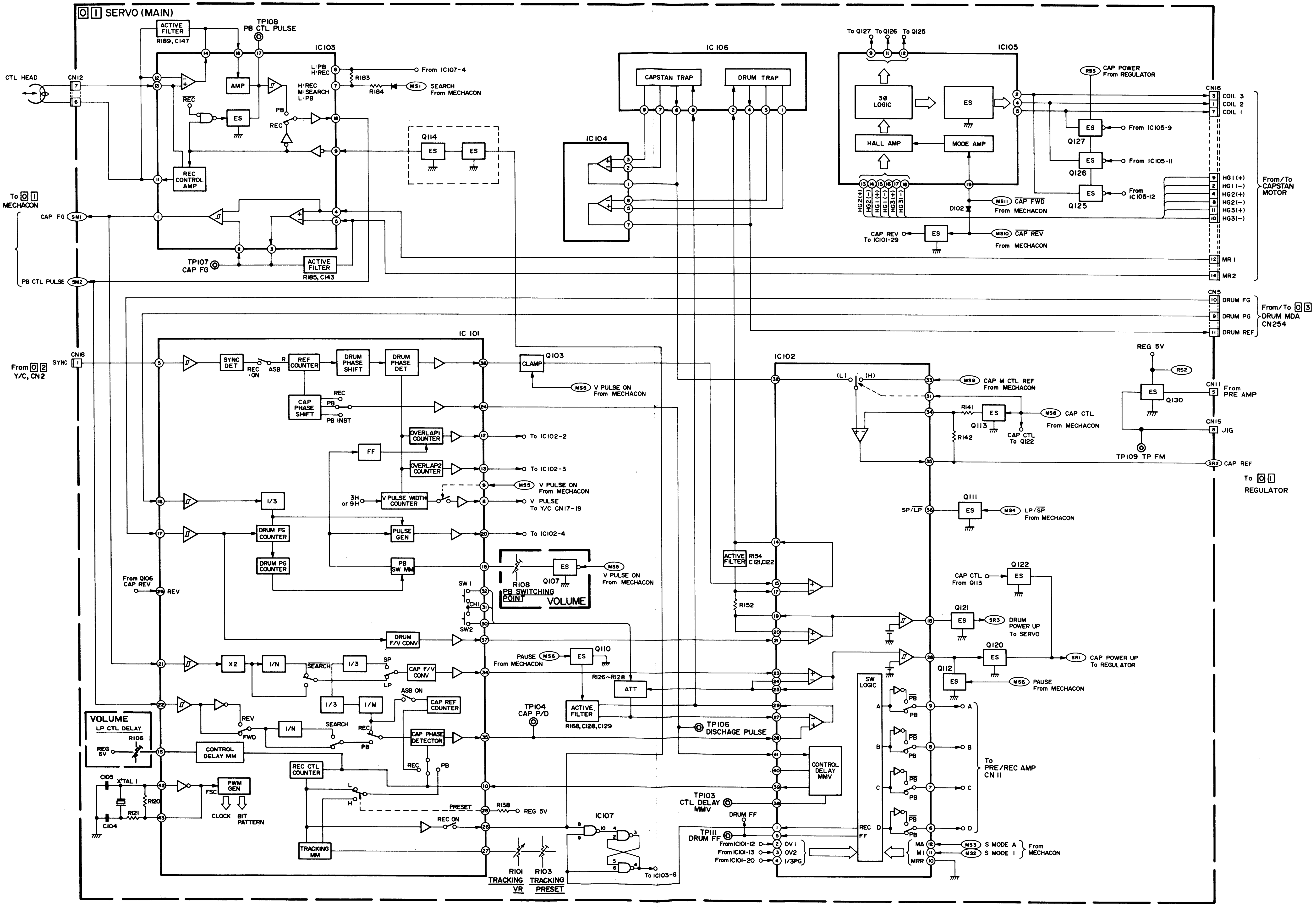
4.6 POWER SYSTEM BLOCK DIAGRAM


07 TRIGGER
BATTERY TERMINAL DC 9.6V
BATTERY(+)
NC
BATTERY(−)
DC JACK
GND
UNREG
CN1
CN2
F1 AC250V 3.15A
D1
R1
CN4
UNREG 9.6V
CAM PWR CTL
CN5
AC ADAPTER
01 MAIN (REGULATOR SECTION)
(MECHACON SECTION)
(AUDIO SECTION)
(SERVO SECTION)
CN9
IC 1
5V REG
TP2
UNSW 5V
CP4
CP5
CP1
CP2
CP3
DC-DC CONVERTER
CAPSTAN REG
DRUM REG
SWD 5V
Q2
D2
Q3
IC2,Q1,Q4
8V REG
R4
REG 8V ADJ
To Q419
POWER ON
POWER ON From IC401-1
BATTERY CHECK
UNREG To IC401 -33
UNREG 9.6V
Q417
V REC From Q408
From IC401-48 CAM PWR CTL
CN11
CN6
CN15
JIG
REG 8V
REG 5V
CN1
CN7
PB 5V
CN19
CN10
Q112
Q120
From IC102 -26
From IC101 -28
CAP POWER
Q122
From MECHACON DRUM FF
Q121
From IC102-18
RM1
MR1
RM2
RM6
RM5
RM4
RA2
RA1
RS1
RS2
RS3
SR1
SR3
SM3
ES
CN18
CN17
CN5
LCD MODULE
CNA
UNSW 5V
REG 5V
CAM PWR CTL
OPERATION UNIT
PRE/REC AMP
V REC 8V
PB 5V
15 RELAY DRIVE
REG 5V
23 ENCODER
CN306
CN303
CP301
UNREG 9.6V
CAM PWR CTL
UNSW −8V
UNSW 15V
UNSW 20V
UNSW 9V
UNSW 5V
UNREG 9V
CP302
CN301
CN302
DC-DC CONVERTER
UNREG 9.6V
CAMERA POWER CTL
UNSW −8V
UNSW 15V
UNSW 20V
UNSW 9V
UNSW 5V
UNREG 9V
43 H DRIVER
UNSW 9V
22 VIDEO-2
UNSW 5V
UNSW 9V
CN206
CN106
21 VIDEO-1
UNSW 5V
UNSW 9V
UNSW 5V(VR)
UNSW −8V
UNSW 15V
CN102
CN101
CN103
CN403
24 IND
CN406
CN408
UNSW 5V
UNREG 9V
OP BLOCK
ZOOM SW
AF UNIT
CN404
CN1501
25 FAW
03 DRUM MDA
CN254
DRUM POWER
REG 5V
26 MIC AMP
CN702
REG 5V
06 JACK
AV CONNECTOR
REG 8V
02 Y/C
CN2
Q26
EE 5V
V EE
Q27
PB 5V
V PB
Q32
CN3
UNREG 9.6V
IC 10
PB 9V REG
PB 9V
CN1
FW1
CN6
VF CONNECTOR

4.7 AUDIO BLOCK DIAGRAM

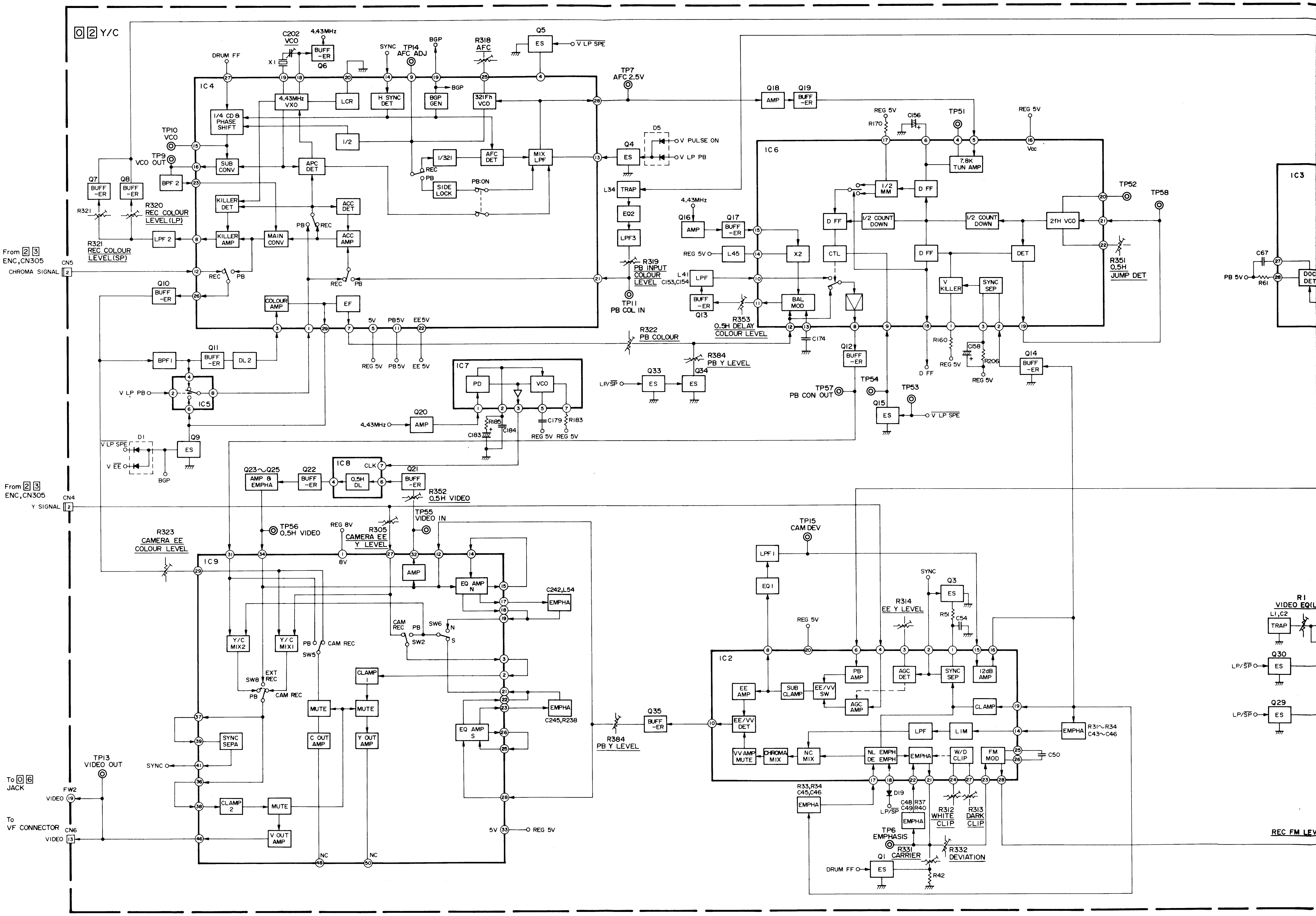

01 AUDIO (MAIN)
IC301
From MECHACON
CAM/EXT
MA1
From 26
MIC AMP
CN702
MIC AUDIO
CN7
MIC
LINE
AUDIO PB LEVEL
REC
PB
TRAP 301 15.625KHz
TRAP
R309
TRAP 301 37.5Hz
TRAP
EP/SP
PB NFB
R306
R308
R311
C307
C308
R312
From MECHACON
A EE MODE
MA4
EE PB CTL
C313
R316
R318
C312
ALC LEVEL
BIAS
LINE AMP
BIAS
PB AMP
MUTE CTL
MA3
A ALL MUTE
From MECHACON
From MECHACON
A REC BIAS
MA5
EE REC CTL
REC AMP
PB BUFF
L302
EQ
C319
R320
REC NFB
From MECHACON
LP/SP
MA2
LP/SP
LP : ON
HEAD SW CTL
Vcc
RIPPLE FILTER
C306
REG 5V
REG 5V
Q302
ES
Q303
ES
From MECHACON
A EE MODE
MA9
Q310
ES
TP302
AUDIO OUT
C311
R314
R305
LP SW
C310
R313
C309
LP/SP
TP304 TP303
BIAS LEVEL-1
BIAS LEVEL-2
CN12
AUDIO HEAD
CN17
AUDIO
To 02
Y/C, CN1
From SERVO
CN12
CTL HEAD
AE HEAD
R342
AUDIO BIAS LEVEL
ERASE & BIAS OSC
Q304
Q305
L303
CN3
FE HEAD
REG 8V
ES
MA5
A REC BIAS
From MECHACON
Q309
ES
Q306
ES
REG 8V
Q307
ES
Q308
ES
A EE MODE
From MECHACON
MA4

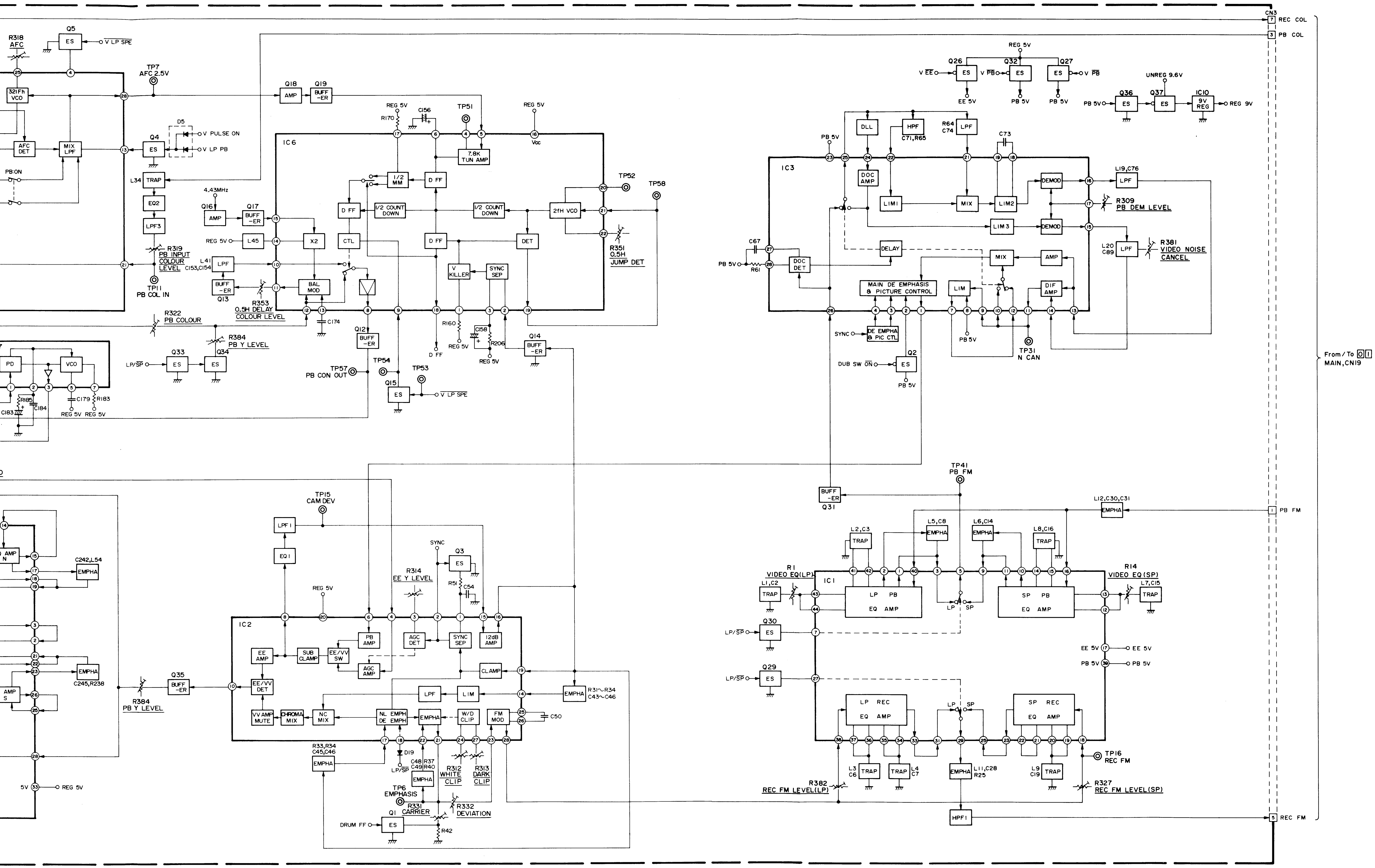
4.8 SERVO BLOCK DIAGRAM



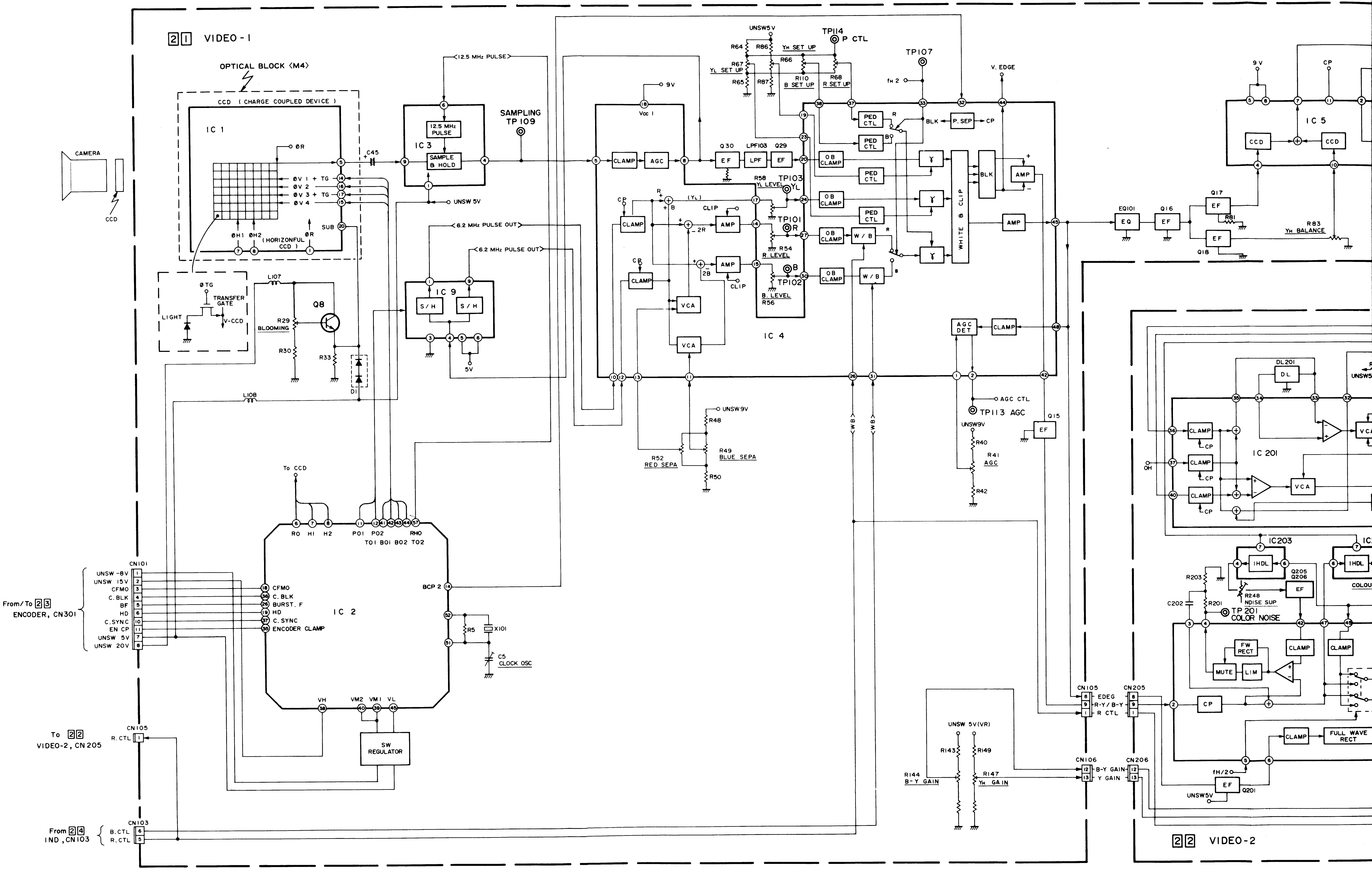
01 SERVO (MAIN)
ACTIVE FILTER
R189, C147
TP108
PB CTL PULSE
IC103
CTL HEAD
CN12
AMP
REC
ES
PB
REC CONTROL AMP
L:PB H:REC
H:REC M:SEARCH L:PB
R183
R184
From IC107-4
MS1 SEARCH From MECHACON
Q114
ES
To 01 MECHACON
CAP FG SM1
PB CTL PULSE SM2
TP107 CAP FG
ACTIVE FILTER
R185, C143
IC106
CAPSTAN TRAP
DRUM TRAP
IC104
To Q127
To Q126
To Q125
IC105
3Ø LOGIC
HALL AMP
MODE AMP
HG2(+)
HG2(-)
HG1(+)
HG1(-)
HG3(+)
HG3(-)
D102
MS11 CAP FWD From MECHACON
CAP REV To IC101-29
MS10 CAP REV From MECHACON
RS3 CAP POWER From REGULATOR
Q127
Q126
Q125
From IC105-9
From IC105-11
From IC105-12
CN16
COIL 3
COIL 2
COIL 1
HG1(+)
HG1(-)
HG2(+)
HG2(-)
HG3(+)
HG3(-)
MR1
MR2
From/To CAPSTAN MOTOR
CN5
DRUM FG
DRUM PG
DRUM REF
From/To 03 DRUM MDA CN254
IC101
From 02 Y/C, CN2
SYNC
CN18
SYNC DET
REC ASB ON
REF COUNTER
DRUM PHASE SHIFT
DRUM PHASE DET
CAP PHASE SHIFT
PB INST
OVERLAP1 COUNTER
OVERLAP2 COUNTER
FF
To IC102-2
To IC102-3
MS5 V PULSE ON From MECHACON
V PULSE To Y/C CN17-19
1/3
3H or 9H
V PULSE WIDTH COUNTER
DRUM FG COUNTER
PULSE GEN
To IC102-4
DRUM PG COUNTER
PB SW MM
R108 PB SWITCHING POINT VOLUME
Q107
MS5 V PULSE ON From MECHACON
From Q106 CAP REV
REV
SW1
CH1
SW2
DRUM F/V CONV
X2
1/N
SEARCH
1/3
SP
LP
CAP F/V CONV
1/M
ASB ON
CAP REF COUNTER
VOLUME
LP CTL DELAY
R106
REG 5V
FWD
CONTROL DELAY MM
CAP PHASE DETECTOR
REC CTL COUNTER
C105
XTAL1
R120
R121
C104
FSC
PWM GEN
CLOCK
BIT PATTERN
PRESET
R138 REG 5V
REC ON
TRACKING MM
R101 TRACKING VR
R103 TRACKING PRESET
CLAMP Q103
MS5 V PULSE ON From MECHACON
PAUSE MS6 From MECHACON
Q110
R126~R128
ATT
ACTIVE FILTER
R168, C128, C129
TP104 CAP P/D
TP106 DISCHAGE PULSE
IC107
To IC103-6
TP103 CTL DELAY MMV
TP111 DRUM FF
DRUM FF
IC102
(L) (H)
MS9 CAP M CTL REF From MECHACON
R141
Q113
R142
MS8 CAP CTL From MECHACON
CAP CTL To Q122
ACTIVE FILTER R154 C121, C122
R152
SP/LP
Q111
MS4 LP/SP From MECHACON
CAP CTL From Q113
Q122
Q121
SR3 DRUM POWER UP To SERVO
Q120
SR1 CAP POWER UP To REGULATOR
Q112
MS6 PAUSE From MECHACON
SW LOGIC
CONTROL DELAY MMV
REC FF
PB
A
B
C
D
To PRE/REC AMP CN11
From IC101-12 OV1
From IC101-13 OV2
From IC101-20 1/3PG
MA MS3 S MODE A
MI MS2 S MODE 1
MRR
From MECHACON
REG 5V
RS2
ES
Q130
CN11
From PRE AMP
CN15
JIG
TP109 TP FM
SR2 CAP REF
To 01 REGULATOR

4.9 Y/C BLOCK DIAGRAM

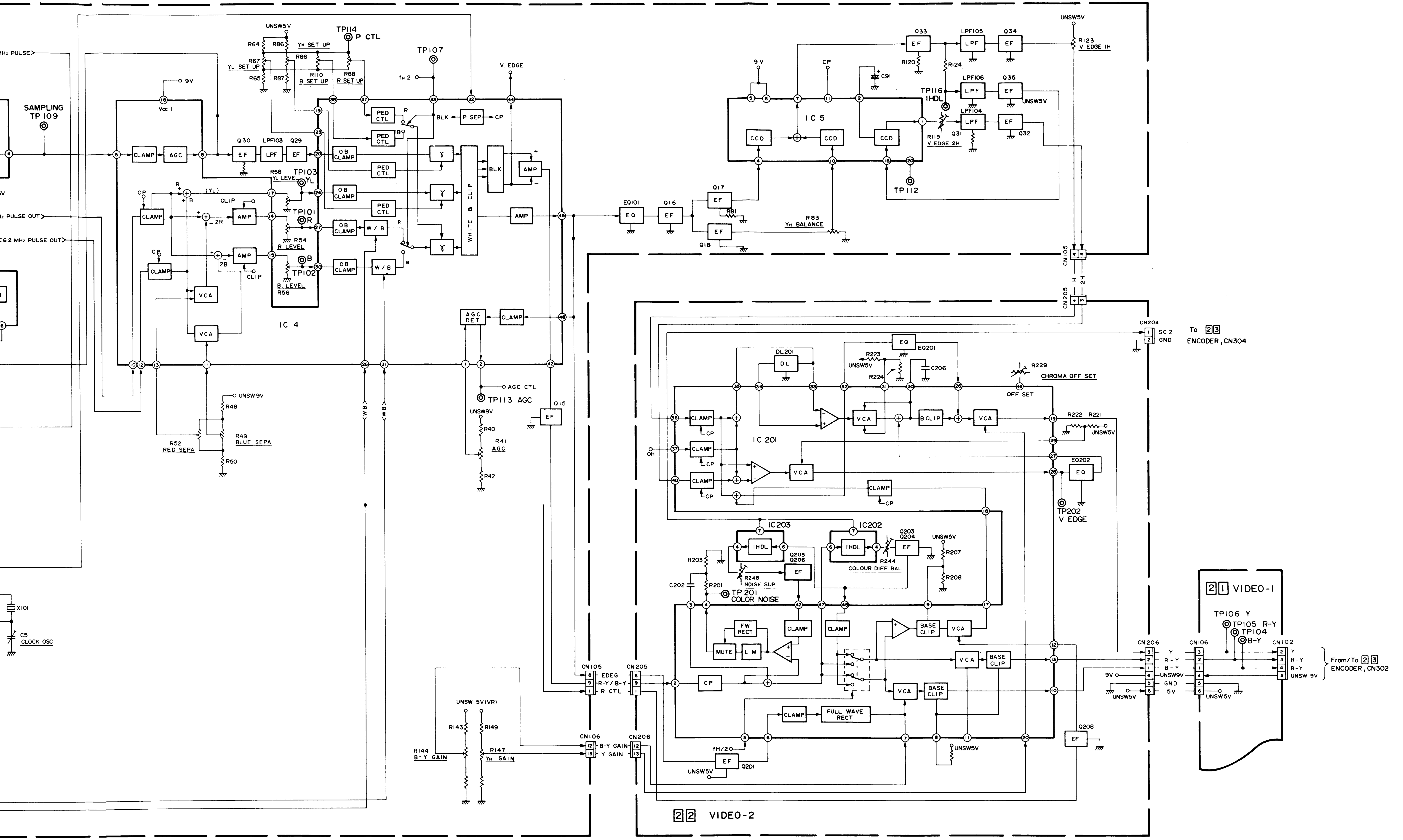

02 Y/C
From 23 ENC,CN305
CN5
CHROMA SIGNAL
From 23 ENC,CN305
CN4
Y SIGNAL
To 06 JACK
FW2
VIDEO
To VF CONNECTOR
CN6
VIDEO
IC4
DRUM FF
C202 VCO
4.43MHz
BUFF -ER
Q6
X1
4.43MHz VXO
LCR
SYNC
H SYNC DET
TP14 AFC ADJ
BGP
BGP GEN
R318 AFC
321Fh VCO
Q5
ES
V LP SPE
TP7 AFC 2.5V
1/4 CD & PHASE SHIFT
SUB CONV
APC DET
1/2
1/321
AFC DET
MIX LPF
REC
PB
SIDE LOCK
PB:ON
TP10 VCO
TP9 VCO OUT
BPF 2
KILLER DET
KILLER AMP
MAIN CONV
ACC DET
ACC AMP
LPF 2
Q7
Q8
BUFF -ER
R321
R320 REC COLOUR LEVEL (LP)
R321 REC COLOUR LEVEL (SP)
Q10
COLOUR AMP
EF
5V
PB5V
EE5V
REG 5V
BPF1
Q11
DL 2
IC5
V LP PB
Q9
ES
D1
V LP SPE
V EE
BGP
IC7
PD
VCO
Q20
AMP
C183
R185
C184
C179
R183
IC8
CLK
0.5H DL
Q21
Q22
Q23~Q25
AMP & EMPHA
R352 0.5H VIDEO
TP56 0.5H VIDEO
REG 8V
R305 CAMERA EE Y LEVEL
TP55 VIDEO IN
R323 CAMERA EE COLOUR LEVEL
IC9
8V
EQ AMP N
C242,L54
EMPHA
Y/C MIX2
Y/C MIX1
CAM REC
SW5
SW6
SW2
N
S
EXT REC
SW8
CLAMP 1
MUTE
C OUT AMP
Y OUT AMP
EQ AMP S
C245,R238
SYNC SEPA
SYNC
CLAMP 2
V OUT AMP
TP13 VIDEO OUT
NC
REG 5V
Q4
D5
V PULSE ON
V LP PB
L34
TRAP
EQ2
LPF3
R319 PB INPUT COLOUR LEVEL
TP11 PB COL IN
4.43MHz
Q16
Q17
REG 5V
L45
L41
LPF
C153,C154
Q13
R353 0.5H DELAY COLOUR LEVEL
R322 PB COLOUR
R384 PB Y LEVEL
Q33
Q34
LP/SP
TP57 PB CON OUT
TP54
TP53
Q15
Q18
Q19
IC6
REG 5V
R170
C156
TP51
Vcc
7.8K TUN AMP
1/2 MM
D FF
1/2 COUNT DOWN
2fH VCO
TP52
TP58
X2
CTL
BAL MOD
V KILLER
SYNC SEP
DET
R351 0.5H JUMP DET
C174
Q12
R160
C158
R206
Q14
TP15 CAM DEV
LPF1
EQ1
SYNC
Q3
R314 EE Y LEVEL
R51
C54
IC2
PB AMP
AGC DET
SYNC SEP
12dB AMP
EE AMP
SUB CLAMP
EE/VV SW
AGC AMP
CLAMP
EE/VV DET
LPF
LIM
EMPHA
R31~R34 C43~C46
VV AMP MUTE
CHROMA MIX
NC MIX
NL EMPH DE EMPH
W/D CLIP
FM MOD
C50
Q35
R384 PB Y LEVEL
R33,R34 C45,C46
D19
C48 C49
R37 R40
R312 WHITE CLIP
R313 DARK CLIP
TP6 EMPHASIS
R331 CARRIER
R332 DEVIATION
Q1
DRUM FF
R42
IC3
C67
PB 5V
R61
R1 VIDEO EQ
L1,C2
TRAP
Q30
Q29
REC FM LEV


R318
AFC
Q5
ES
V LP SPE
TP7
AFC 2.5V
321Fh VCO
AFC DET
MIX LPF
Q4
ES
D5
V PULSE ON
V LP PB
PB:ON
L34
TRAP
EQ2
LPF3
R319
PB INPUT COLOUR LEVEL
TP11
PB COL IN
Q18
AMP
Q19
BUFF -ER
REG 5V
R170
C156
TP51
IC6
7.8K TUN AMP
Vcc
1/2 MM
D FF
1/2 COUNT DOWN
2fH VCO
DET
CTL
X2
BAL MOD
V KILLER
SYNC SEP
4.43MHz
Q16
AMP
Q17
BUFF -ER
L45
L41
LPF
C153,C154
Q13
R353
0.5H DELAY COLOUR LEVEL
C174
TP52
TP58
R351
0.5H JUMP DET
R322
PB COLOUR
R384
PB Y LEVEL
Q33
Q34
LP/SP
PD
VCO
R185
C183
C184
C179
R183
REG 5V
Q12
TP57
PB CON OUT
TP54
TP53
Q15
V LP SPE
R160
C158
R206
Q14
CN3
REC COL
PB COL
REG 5V
Q26
Q32
Q27
V EE
V PB
EE 5V
PB 5V
UNREG 9.6V
Q36
Q37
IC10
9V REG
REG 9V
DLL
HPF
C71,R65
R64
C74
C73
IC3
DOC AMP
LIM1
MIX
LIM2
DEMOD
LIM3
L19,C76
R309
PB DEM LEVEL
L20
C89
R381
VIDEO NOISE CANCEL
C67
R61
DOC DET
DELAY
MAIN DE EMPHASIS & PICTURE CONTROL
LIM
DIF AMP
SYNC
DE EMPHA & PIC CTL
Q2
DUB SW ON
TP31
N CAN
From / To 01
MAIN, CN19
TP41
PB FM
Q31
L12,C30,C31
EMPHA
PB FM
L2,C3
L5,C8
L6,C14
L8,C16
R1
VIDEO EQ(LP)
L1,C2
IC1
LP PB EQ AMP
SP PB EQ AMP
R14
VIDEO EQ(SP)
L7,C15
Q30
Q29
EE 5V
PB 5V
LP REC EQ AMP
SP REC EQ AMP
L3
C6
L4
C7
L11,C28
R25
L9
C19
TP16
REC FM
R382
REC FM LEVEL(LP)
R327
REC FM LEVEL(SP)
HPF1
REC FM
TP15
CAM DEV
LPF1
EQ1
SYNC
Q3
R314
EE Y LEVEL
R51
C54
IC2
EE AMP
SUB CLAMP
EE/VV SW
PB AMP
AGC DET
SYNC SEP
12dB AMP
AGC AMP
CLAMP
EE/VV DET
LPF
VV AMP MUTE
CHROMA MIX
NC MIX
NL EMPH DE EMPH
W/D CLIP
FM MOD
C50
R31~R34
C43~C46
Q35
C242,L54
C245,R238
R33,R34
C45,C46
D19
C48 C49
R37 R40
R312
WHITE CLIP
R313
DARK CLIP
TP6
EMPHASIS
R331
CARRIER
R332
DEVIATION
Q1
DRUM FF
R42
5V

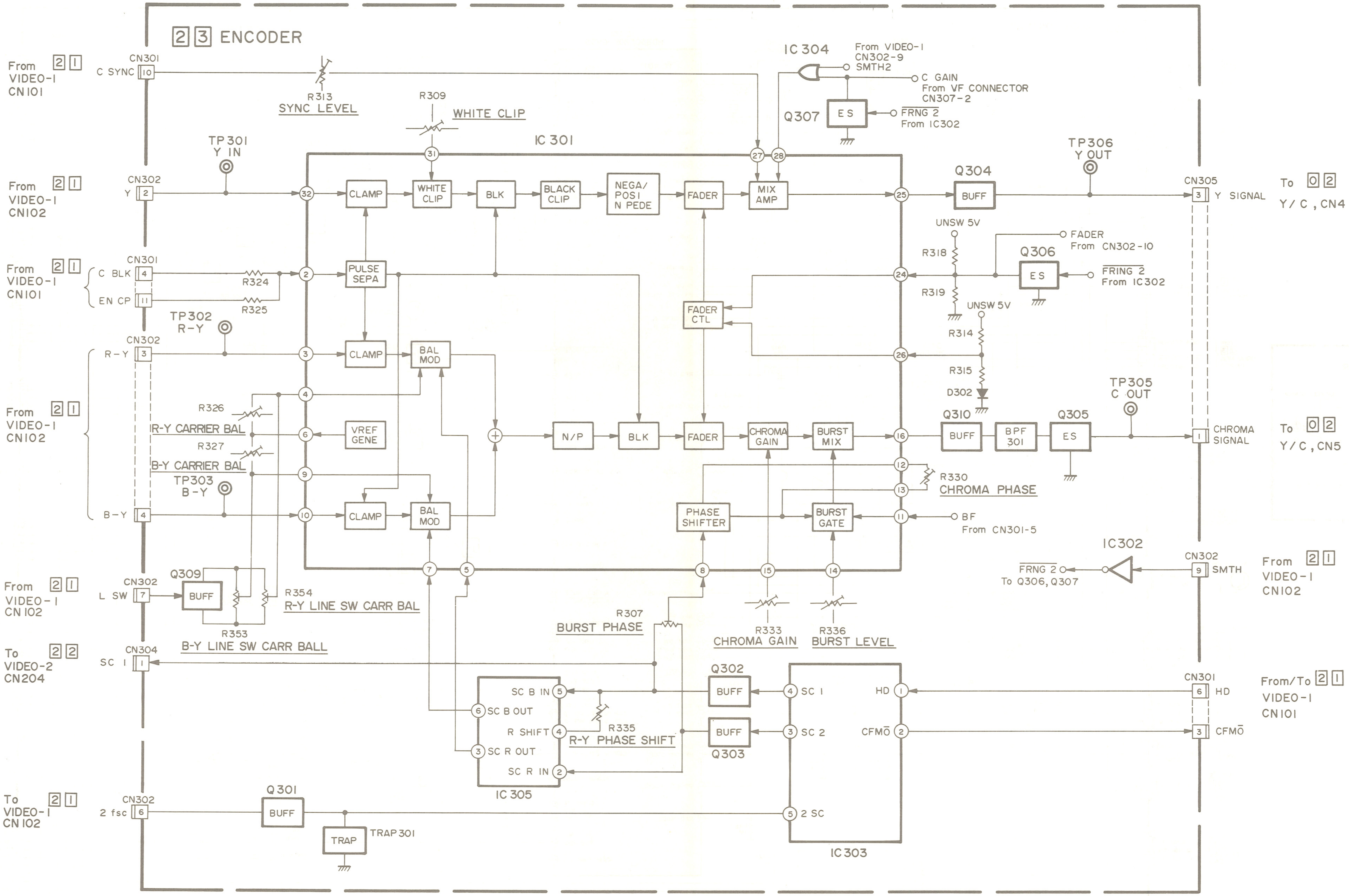
4.10 VIDEO BLOCK DIAGRAM



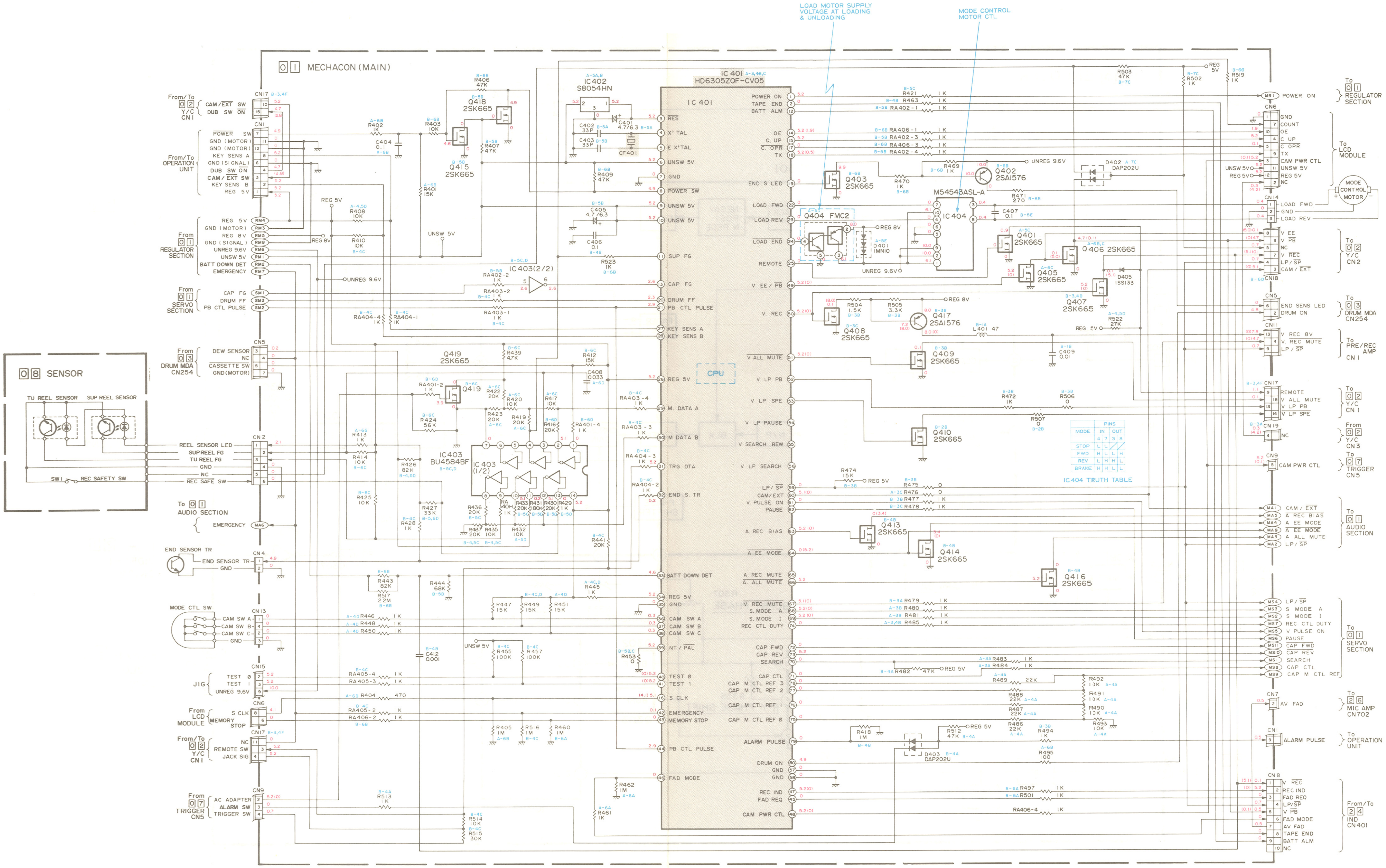
2 1 VIDEO - 1
OPTICAL BLOCK (M4)
CCD (CHARGE COUPLED DEVICE)
IC 1
ØR
ØV 1 + TG
ØV 2
ØV 3 + TG
ØV 4
SUB
ØH1 ØH2 (HORIZONFUL CCD)
CAMERA
CCD
C45
12.5 MHz PULSE
IC 3
12.5 MHz PULSE
SAMPLE & HOLD
SAMPLING TP 109
UNSW 5V
6.2 MHz PULSE OUT
IC 9
S/H
5V
ØTG
TRANSFER GATE
LIGHT
V-CCD
L107
Q8
R29 BLOOMING
R30
R33
D1
L108
To CCD
R0 H1 H2 P01 P02 RH0
T01 B01 B02 T02
CN101
UNSW -8V
UNSW 15V
CFMO
C. BLK
BF
HD
C. SYNC
EN CP
UNSW 5V
UNSW 20V
From/To 2 3 ENCODER, CN301
CFMO
C. BLK
BURST. F
HD
C. SYNC
ENCODER CLAMP
IC 2
BCP 2
R5
X101
C5 CLOCK OSC
VH VM2 VM1 VL
SW REGULATOR
To 2 2 VIDEO-2, CN 205
CN105
R. CTL
From 2 4 IND, CN103
CN103
B. CTL
R. CTL
9V
Vcc 1
CLAMP
AGC
UNSW5V
R64
R86
YH SET UP
R67
YL SET UP
R65
R87
R66
R110 B SET UP
R68 R SET UP
TP114 P CTL
TP107
fH 2
V. EDGE
Q30 LPF103 Q29
EF
LPF
PED CTL
R
B
BLK
P. SEP
CP
OB CLAMP
γ
WHITE & CLIP
AMP
R58 YL LEVEL
TP103 YL
(YL)
CLIP
TP101 R
-2R
R54 R LEVEL
2B
TP102 B
B. LEVEL R56
W/B
VCA
IC 4
AGC DET
UNSW9V
R48
R49 BLUE SEPA
R52 RED SEPA
R50
WB
AGC CTL
TP113 AGC
R40
R41 AGC
R42
Q15
EQ101 Q16
EQ
Q17
R81
Q18
R83 YH BALANCE
9V
CP
IC 5
CCD
DL201
DL
IC 201
ØH
VCA
IC203
1HDL
Q205 Q206
R203
R248 NOISE SUP
C202
R201
TP 201 COLOR NOISE
COLOU
FW RECT
MUTE
LIM
CN105
EDEG
R-Y/B-Y
R CTL
CN205
FULL WAVE RECT
fH/2
Q201
UNSW5V
UNSW 5V(VR)
R143
R149
R144 B-Y GAIN
R147 YH GAIN
CN106
CN206
B-Y GAIN
Y GAIN
2 2 VIDEO-2


SAMPLING TP109
IC 4
IC 5
IC 201
IC203
IC202
TP114 P CTL
TP107
TP103 YL
TP101 R
TP102 B
TP113 AGC
TP116 IHDL
TP112
TP201 COLOR NOISE
TP202 V EDGE
TP106 Y
TP105 R-Y
TP104 B-Y
UNSW5V
UNSW9V
R64
R86
R66
R67
R65
R87
R110
R68
YH SET UP
YL SET UP
B SET UP
R SET UP
V. EDGE
fH 2
CLAMP
AGC
Q30
LPF103
Q29
EF
LPF
PED CTL
OB CLAMP
P. SEP
BLK
CP
WHITE & CLIP
AMP
CLIP
VCA
W / B
R58 YL LEVEL
R54 R LEVEL
R56 B LEVEL
R48
R49 BLUE SEPA
R52 RED SEPA
R50
AGC DET
AGC CTL
R40
R41 AGC
R42
Q15
X101
C5 CLOCK OSC
Q33
LPF105
Q34
R123 V EDGE 1H
R120
R124
LPF106
Q35
LPF104
Q31
Q32
R119 V EDGE 2H
9V
C91
CCD
EQ101
Q16
Q17
Q18
R81
R83 YH BALANCE
CN105
CN205
1H
2H
CN204
SC 2
GND
To 23 ENCODER, CN304
DL201
DL
EQ
EQ201
R223
R224
C206
R229 CHROMA OFF SET
OFF SET
B CLIP
R222
R221
EQ202
0H
IHDL
Q203 Q204
Q205 Q206
R244 COLOUR DIFF BAL
R207
R208
R203
R248 NOISE SUP
C202
R201
FW RECT
MUTE
LIM
BASE CLIP
FULL WAVE RECT
fH/2
Q201
Q208
EDEG
R-Y/B-Y
R CTL
CN106
CN206
B-Y GAIN
Y GAIN
UNSW 5V(VR)
R143
R149
R144 B-Y GAIN
R147 YH GAIN
21 VIDEO-1
22 VIDEO-2
CN102
Y
R-Y
B-Y
UNSW9V
5V
From/To 23 ENCODER, CN302

4.11 ENCODER BLOCK DIAGRAM


2 3 ENCODER
From 2 1 VIDEO-1 CN101
CN301
C SYNC 10
R313
SYNC LEVEL
R309
WHITE CLIP
IC 301
IC 304
From VIDEO-1 CN302-9 SMTH2
C GAIN From VF CONNECTOR CN307-2
Q307
ES
FRNG 2 From IC302
TP301 Y IN
From 2 1 VIDEO-1 CN102
CN302
Y 2
CLAMP
WHITE CLIP
BLK
BLACK CLIP
NEGA/ POSI N PEDE
FADER
MIX AMP
Q304
BUFF
TP306 Y OUT
CN305
3 Y SIGNAL
To 0 2 Y/C, CN4
UNSW 5V
R318
FADER From CN302-10
Q306
ES
FRNG 2 From IC302
R319
UNSW 5V
R314
R315
D302
From 2 1 VIDEO-1 CN101
C BLK 4
EN CP 11
R324
R325
PULSE SEPA
FADER CTL
TP302 R-Y
R-Y 3
BAL MOD
From 2 1 VIDEO-1 CN102
R326
R-Y CARRIER BAL
VREF GENE
R327
B-Y CARRIER BAL
TP303 B-Y
B-Y 4
N/P
CHROMA GAIN
BURST MIX
Q310
BUFF
BPF 301
Q305
ES
TP305 C OUT
1 CHROMA SIGNAL
To 0 2 Y/C, CN5
R330
CHROMA PHASE
PHASE SHIFTER
BURST GATE
BF From CN301-5
IC302
CN302
9 SMTH
FRNG 2
To Q306, Q307
From 2 1 VIDEO-1 CN102
From 2 1 VIDEO-1 CN102
L SW 7
Q309
BUFF
R354
R-Y LINE SW CARR BAL
R353
B-Y LINE SW CARR BALL
R307
BURST PHASE
R333
CHROMA GAIN
R336
BURST LEVEL
To 2 2 VIDEO-2 CN204
CN304
SC 1
Q302
BUFF
Q303
SC B IN
SC B OUT
R SHIFT
SC R OUT
SC R IN
R335
R-Y PHASE SHIFT
IC 305
SC 1
SC 2
HD
CFMO
CN301
6 HD
3 CFMO
From/To 2 1 VIDEO-1 CN101
To 2 1 VIDEO-1 CN102
CN302
2 fsc 6
Q301
BUFF
TRAP
TRAP 301
2 SC
IC303

4.12 MECHACON SCHEMATIC DIAGRAM

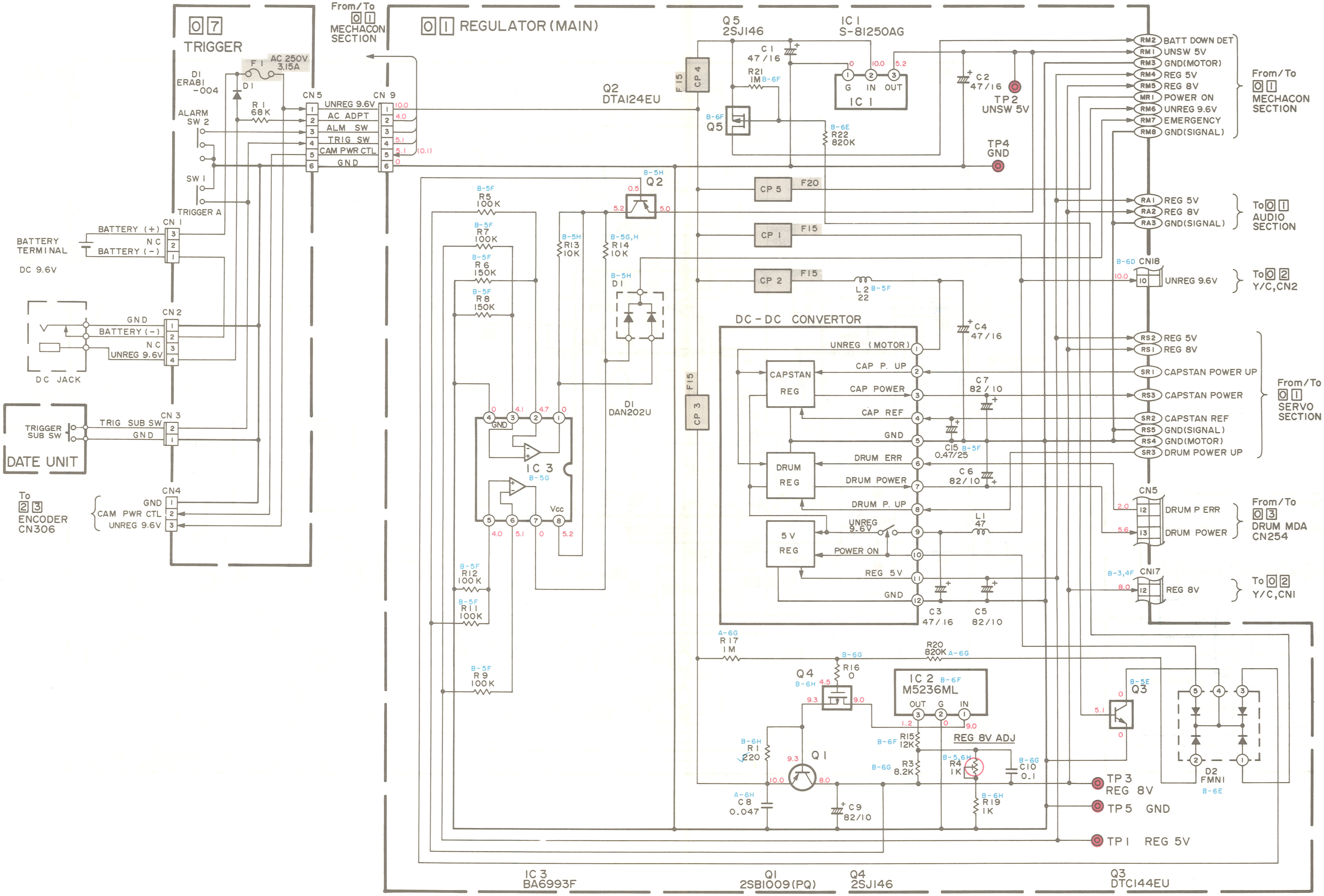


LOAD MOTOR SUPPLY VOLTAGE AT LOADING & UNLOADING
MODE CONTROL MOTOR CTL
01 MECHACON (MAIN)
IC401 HD6305Z0F-CV05
IC401
CPU
IC402 S8054HN
IC403 BU4584BF
IC403(2/2)
IC403 (1/2)
IC404 M54543ASL-A
Q404 FMC2
Q401 2SK665
Q402 2SA1576
Q403 2SK665
Q405 2SK665
Q406 2SK665
Q407 2SK665
Q408 2SK665
Q409 2SK665
Q410 2SK665
Q413 2SK665
Q414 2SK665
Q415 2SK665
Q416 2SK665
Q417 2SA1576
Q418 2SK665
Q419 2SK665
D401 1MN10
D402 DAP202U
D403 DAP202U
D405 1SS133
CF401
08 SENSOR
TU REEL SENSOR
SUP REEL SENSOR
SW1
REC SAFETY SW
REEL SENSOR LED
SUP REEL FG
TU REEL FG
GND
NC
REC SAFE SW
From/To 02 Y/C CN1
CAM/EXT SW
DUB SW ON
From/To OPERATION UNIT
POWER SW
GND (MOTOR)
KEY SENS A
GND (SIGNAL)
DUB SW ON
CAM/EXT SW
KEY SENS B
REG 5V
From 01 REGULATOR SECTION
REG 5V
GND (MOTOR)
REG 8V
GND (SIGNAL)
UNREG 9.6V
UNSW 5V
BATT DOWN DET
EMERGENCY
From 01 SERVO SECTION
CAP FG
DRUM FF
PB CTL PULSE
From 03 DRUM MDA CN254
DEW SENSOR
CASSETTE SW
GND(MOTOR)
To 01 AUDIO SECTION
EMERGENCY
END SENSOR TR
MODE CTL SW
CAM SW A
CAM SW B
CAM SW C
JIG
TEST 0
TEST 1
UNREG 9.6V
From LCD MODULE
S CLK
MEMORY STOP
From/To 02 Y/C CN1
REMOTE SW
JACK SIG
From 07 TRIGGER CN5
AC ADAPTER
ALARM SW
TRIGGER SW
RES
X'TAL
E X'TAL
UNSW 5V
POWER SW
SUP FG
CAP FG
DRUM FF
PB CTL PULSE
KEY SENS A
KEY SENS B
REG 5V
M. DATA A
M DATA B
TRG DTA
END S. TR
BATT DOWN DET
CAM SW A
CAM SW B
CAM SW C
NT/PAL
TEST 0
TEST 1
S. CLK
EMERGENCY
MEMORY STOP
PB CTL PULSE
FAD MODE
POWER ON
TAPE END
BATT ALM
OE
C. UP
C. OPR
TX
END S LED
LOAD FWD
LOAD REV
LOAD END
REMOTE
V. EE/PB
V. REC
V ALL MUTE
V LP PB
V LP SPE
V LP PAUSE
V SEARCH REW
V LP SEARCH
LP/SP
CAM/EXT
V PULSE ON
PAUSE
A REC BIAS
A EE MODE
A REC MUTE
A. ALL MUTE
V REC MUTE
S. MODE A
S. MODE 1
REC CTL DUTY
CAP FWD
CAP REV
SEARCH
CAP CTL
CAP M CTL REF 3
CAP M CTL REF 2
CAP M CTL REF 1
CAP M CTL REF 0
ALARM PULSE
DRUM ON
REC IND
FAD REQ
CAM PWR CTL
UNREG 9.6V
REG 8V
REG 5V
To 01 REGULATOR SECTION
POWER ON
To LCD MODULE
GND
COUNT
OE
C UP
C OPR
TX
CAM PWR CTL
UNSW 5V
REG 5V
NC
MODE CONTROL MOTOR
LOAD FWD
GND
LOAD REV
To 02 Y/C CN2
V EE
V PB
V REC
LP/SP
CAM/EXT
To 03 DRUM MDA CN254
END SENS LED
DRUM ON
To PRE/REC AMP CN1
V REC 8V
V REC MUTE
LP/SP
To 02 Y/C CN1
REMOTE
V ALL MUTE
V LP PB
V LP SPE
From 02 Y/C CN3
To 07 TRIGGER CN5
CAM PWR CTL
To 01 AUDIO SECTION
CAM/EXT
A REC BIAS
A EE MODE
A EE MODE
A ALL MUTE
LP/SP
To 01 SERVO SECTION
LP/SP
S MODE A
S MODE 1
REC CTL DUTY
V PULSE ON
PAUSE
CAP FWD
CAP REV
SEARCH
CAP CTL
CAP M CTL REF
To 26 MIC AMP CN702
AV FAD
To OPERATION UNIT
ALARM PULSE
From/To 24 IND CN401
V REC
REC IND
FAD REQ
LP/SP
V PB
FAD MODE
AV FAD
TAPE END
BATT ALM
NC

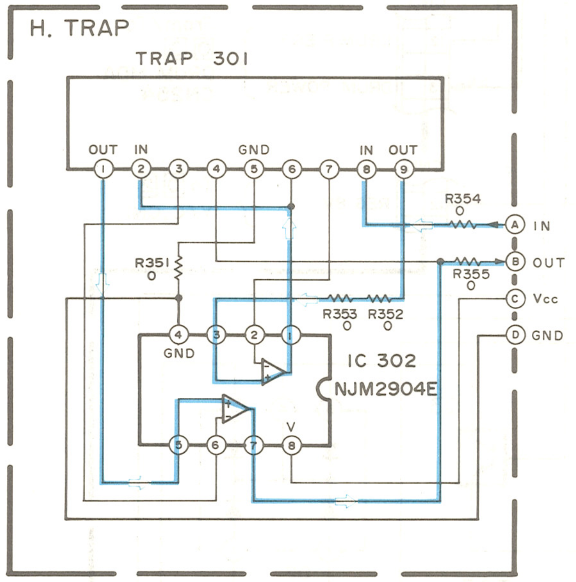
	PINS			
MODE	IN		OUT	
	4	7	3	8
STOP	L	L	/	/
FWD	H	L	L	H
REV	L	H	H	L
BRAKE	H	H	L	L

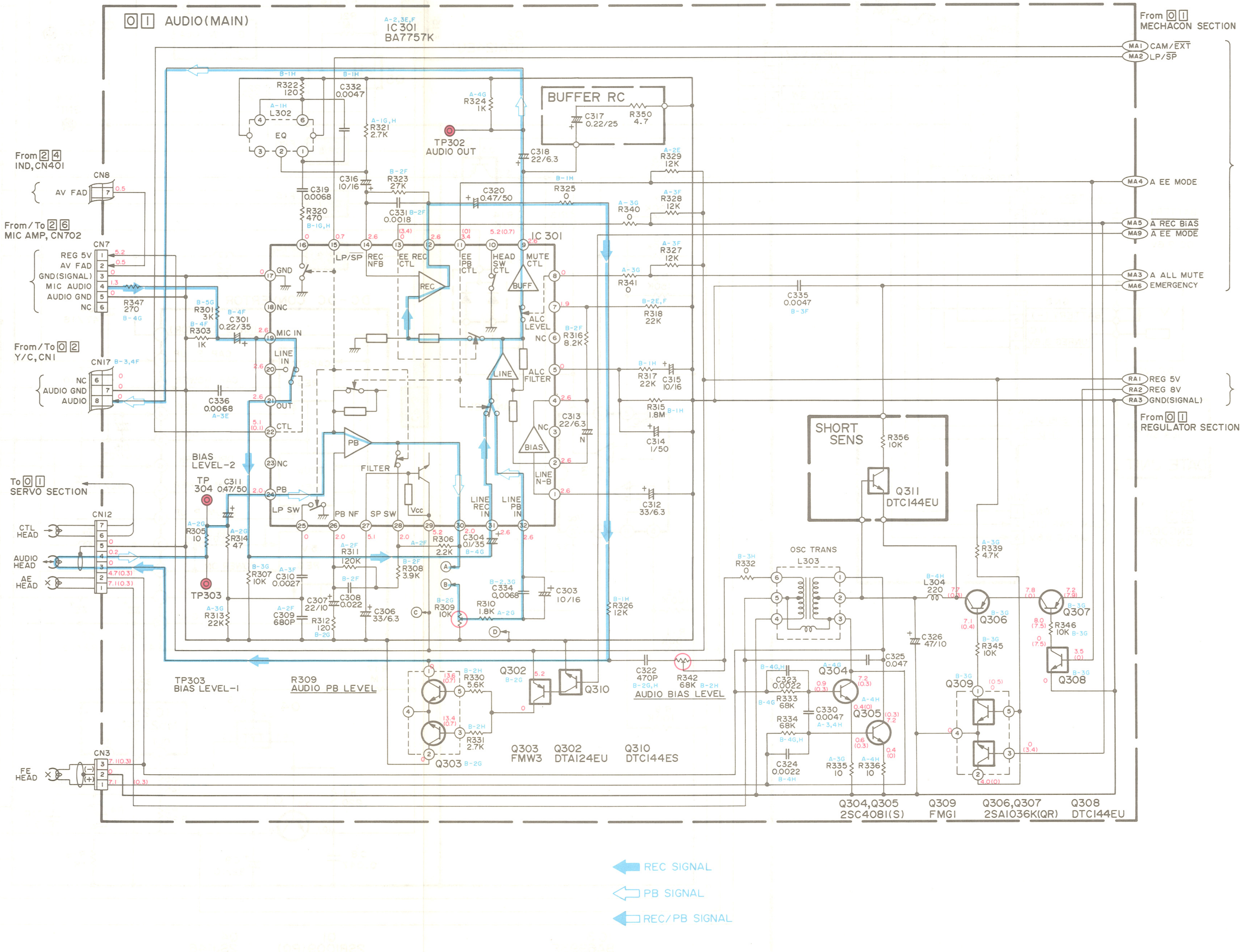
IC404 TRUTH TABLE

4.13 REGULATOR SCHEMATIC DIAGRAM

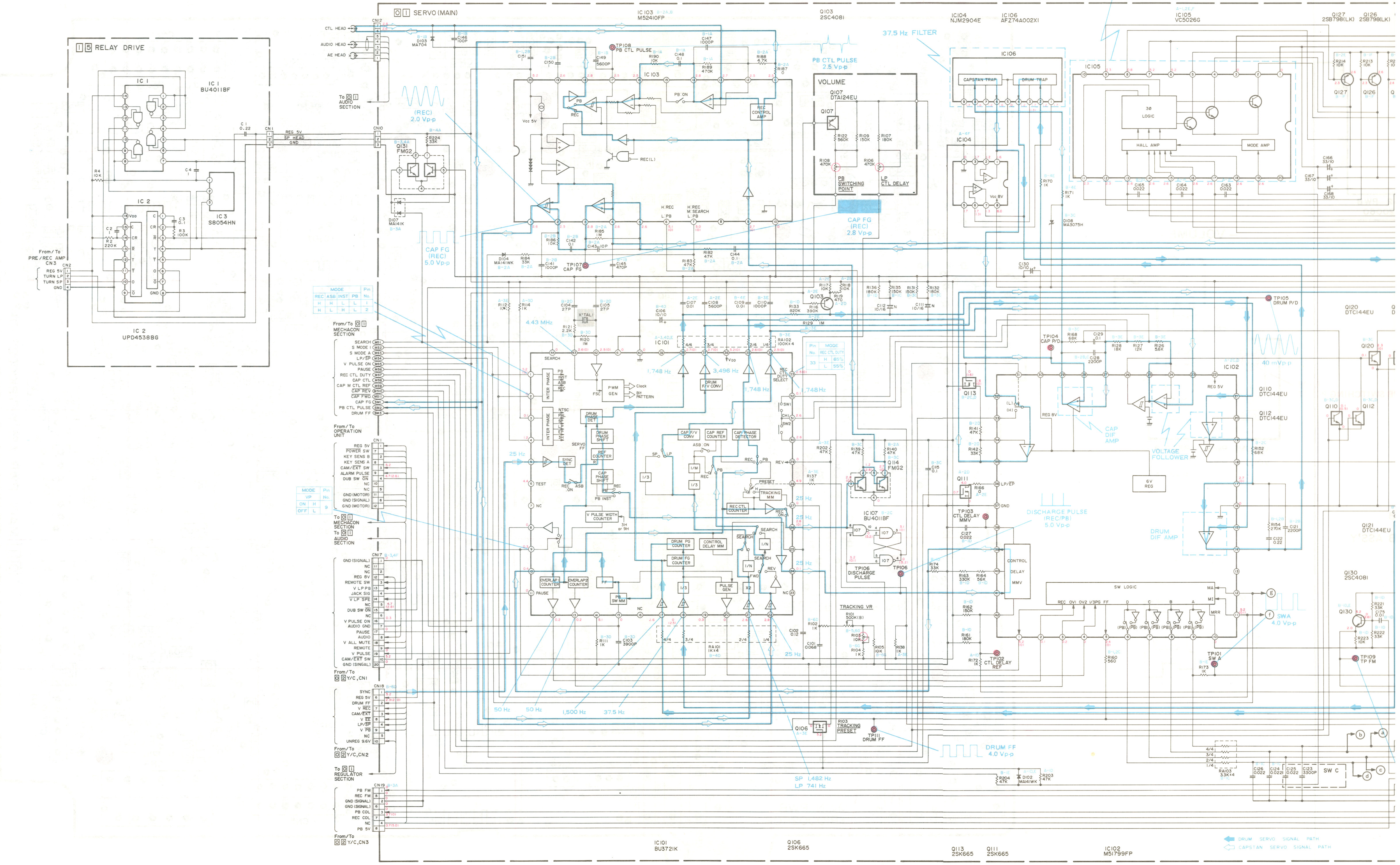

07 TRIGGER
F1 AC 250V 3.15A
D1 ERA81-004
R1 68K
ALARM SW 2
SW 1
TRIGGER A
CN5
UNREG 9.6V
AC ADPT
ALM SW
TRIG SW
CAM PWR CTL
GND
CN9
From/To 01 MECHACON SECTION
01 REGULATOR (MAIN)
Q2 DTA124EU
Q5 2SJ146
C1 47/16
R21 1M
IC1 S-81250AG
G IN OUT
C2 47/16
TP2 UNSW 5V
R22 820K
TP4 GND
CP4 F15
CP5 F20
CP1 F15
CP2 F15
CP3 F15
BATTERY TERMINAL
DC 9.6V
CN1
BATTERY (+)
NC
BATTERY (-)
CN2
GND
BATTERY (-)
NC
UNREG 9.6V
DC JACK
CN3
TRIG SUB SW
GND
TRIGGER SUB SW
DATE UNIT
To 23 ENCODER CN306
CN4
GND
CAM PWR CTL
UNREG 9.6V
R5 100K
R7 100K
R6 150K
R8 150K
R13 10K
R14 10K
D1 DAN202U
IC3
GND
Vcc
R12 100K
R11 100K
R9 100K
L2 22
C4 47/16
DC-DC CONVERTOR
UNREG (MOTOR)
CAPSTAN REG
CAP P. UP
CAP POWER
CAP REF
GND
DRUM REG
DRUM ERR
DRUM POWER
DRUM P. UP
5V REG
UNREG 9.6V
POWER ON
REG 5V
GND
C7 82/10
C15 0.47/25
C6 82/10
L1 47
C3 47/16
C5 82/10
RM2 BATT DOWN DET
RM1 UNSW 5V
RM3 GND(MOTOR)
RM4 REG 5V
RM5 REG 8V
MR1 POWER ON
RM6 UNREG 9.6V
RM7 EMERGENCY
RM8 GND(SIGNAL)
From/To 01 MECHACON SECTION
RA1 REG 5V
RA2 REG 8V
RA3 GND(SIGNAL)
To 01 AUDIO SECTION
CN18 UNREG 9.6V
To 02 Y/C,CN2
RS2 REG 5V
RS1 REG 8V
SR1 CAPSTAN POWER UP
RS3 CAPSTAN POWER
SR2 CAPSTAN REF
RS5 GND(SIGNAL)
RS4 GND(MOTOR)
SR3 DRUM POWER UP
From/To 01 SERVO SECTION
CN5 DRUM P ERR
DRUM POWER
From/To 03 DRUM MDA CN254
CN17 REG 8V
To 02 Y/C,CN1
R17 1M
R20 820K
Q4
R16 0
IC2 M5236ML
OUT G IN
REG 8V ADJ
R15 12K
R3 8.2K
R4 1K
C10 0.1
R19 1K
R1 220
Q1
C8 0.047
C9 82/10
Q3
D2 FMN1
TP3 REG 8V
TP5 GND
TP1 REG 5V
IC3 BA6993F
Q1 2SB1009(PQ)
Q4 2SJ146
Q3 DTC144EU

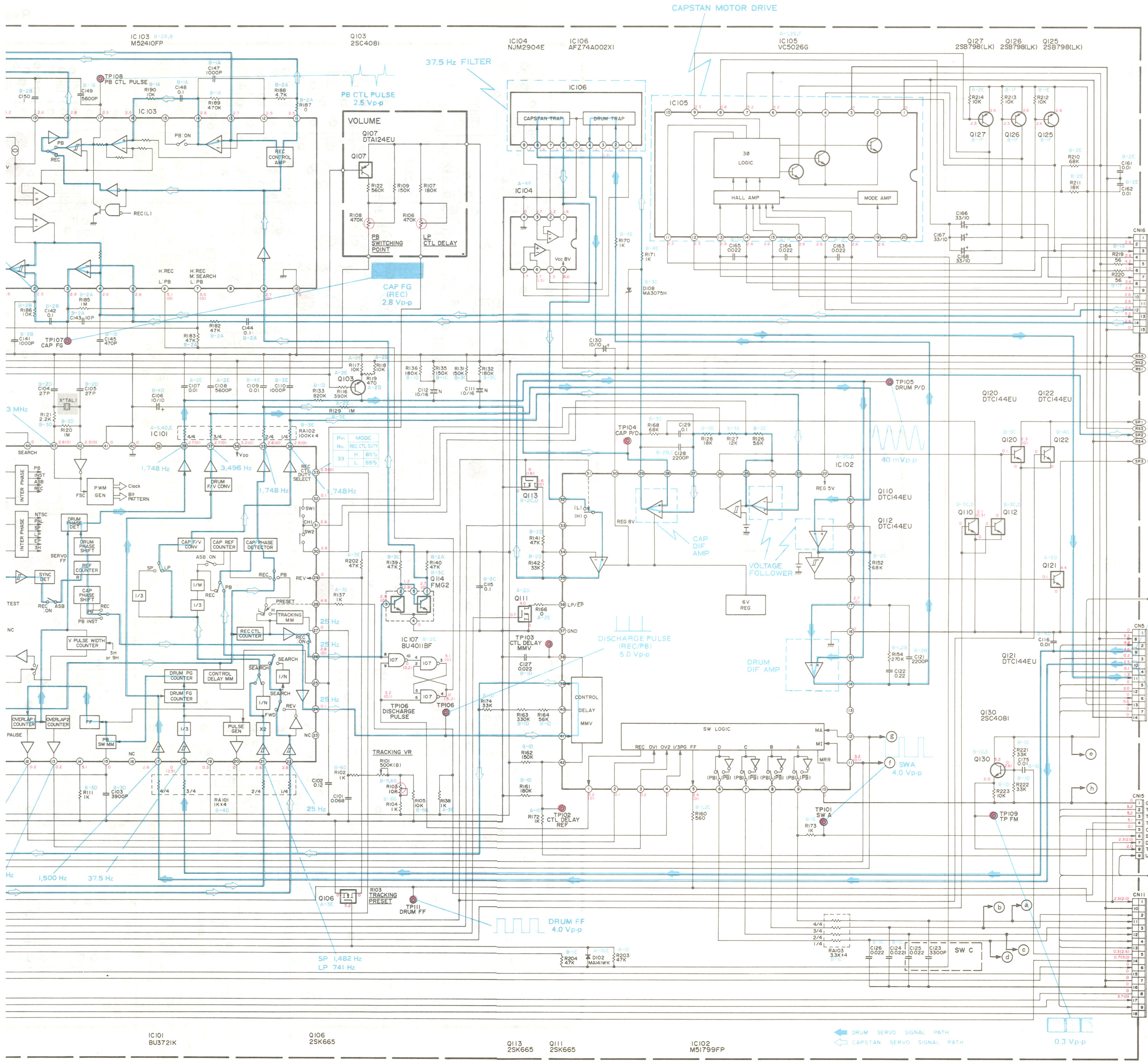
4.14 AUDIO SCHEMATIC DIAGRAM

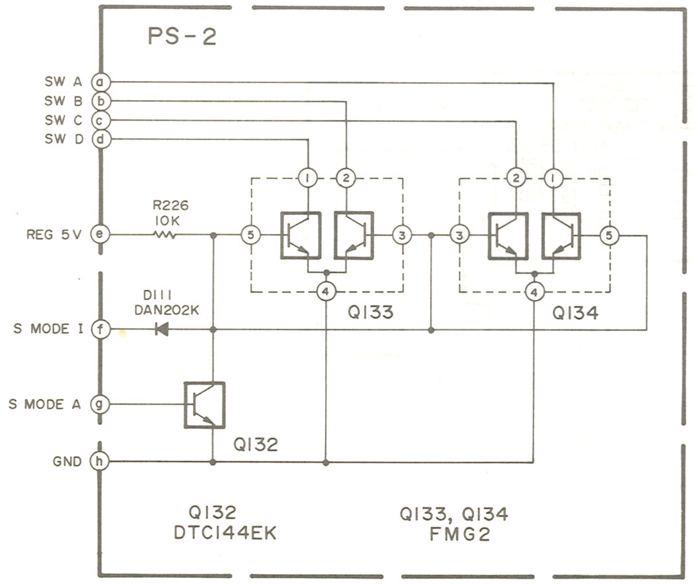

H. TRAP
TRAP 301
OUT IN GND IN OUT
R354 0
R355 0
R351 0
R353 0
R352 0
IC 302
NJM2904E
GND
V
A IN
B OUT
C Vcc
D GND


01 AUDIO(MAIN)
IC301
BA7757K
From 01 MECHACON SECTION
MA1 CAM/EXT
MA2 LP/SP
MA4 A EE MODE
MA5 A REC BIAS
MA9 A EE MODE
MA3 A ALL MUTE
MA6 EMERGENCY
RA1 REG 5V
RA2 REG 8V
RA3 GND(SIGNAL)
From 01 REGULATOR SECTION
From 24 IND,CN401
CN8
AV FAD
From/To 26 MIC AMP, CN702
CN7
REG 5V
AV FAD
GND(SIGNAL)
MIC AUDIO
AUDIO GND
NC
From/To 02 Y/C,CN1
CN17
NC
AUDIO GND
AUDIO
To 01 SERVO SECTION
CN12
CTL HEAD
AUDIO HEAD
AE HEAD
CN3
FE HEAD
BUFFER RC
C317 0.22/25
R350 4.7
R322 120
C332 0.0047
L302
EQ
R321 2.7K
R324 1K
TP302 AUDIO OUT
C318 22/6.3
R329 12K
R328 12K
R340 0
R325 0
C320 0.47/50
C319 0.0068
R320 470
C316 10/16
R323 27K
C331 0.0018
R327 12K
R341 0
C335 0.0047
R318 22K
R316 8.2K
R317 22K
C315 10/16
R315 1.8M
C313 22/6.3
C314 1/50
C312 33/6.3
R347 270
R301 3K
C301 0.22/35
R303 1K
C336 0.0068
LP/SP
REC NFB
EE REC CTL
EE PB CTL
HEAD SW CTL
MUTE CTL
GND
NC
MIC IN
LINE IN
OUT
CTL
NC
PB
LP SW
PB NF
SP SW
Vcc
FILTER
LINE REC IN
LINE PB IN
REC
BUFF
ALC LEVEL
NC
LINE
ALC FILTER
BIAS
LINE N-B
BIAS LEVEL-2
TP 304
C311 0.47/50
R305 10
R314 47
TP303
R313 22K
R307 10K
C310 0.0027
C309 680P
C307 22/10
C308 0.022
R311 120K
R312 120
R308 3.9K
C306 33/6.3
R306 2.2K
C304 0.1/35
C334 0.0068
C303 10/16
R309 10K
R310 1.8K
R326 12K
TP303 BIAS LEVEL-1
R309 AUDIO PB LEVEL
SHORT SENS
R356 10K
Q311 DTC144EU
OSC TRANS
L303
R332 0
R339 4.7K
L304 220
C326 47/10
C325 0.047
C322 470P
R342 68K
AUDIO BIAS LEVEL
C323 0.0022
R333 68K
C330 0.0047
R334 68K
C324 0.0022
R335 10
R336 10
R345 10K
R346 10K
Q302
Q303
Q304
Q305
Q306
Q307
Q308
Q309
Q310
R330 5.6K
R331 2.7K
Q303 FMW3
Q302 DTA124EU
Q310 DTC144ES
Q304,Q305 2SC4081(S)
Q309 FMG1
Q306,Q307 2SA1036K(QR)
Q308 DTC144EU
REC SIGNAL
PB SIGNAL
REC/PB SIGNAL

4.15 SERVO SCHEMATIC DIAGRAM

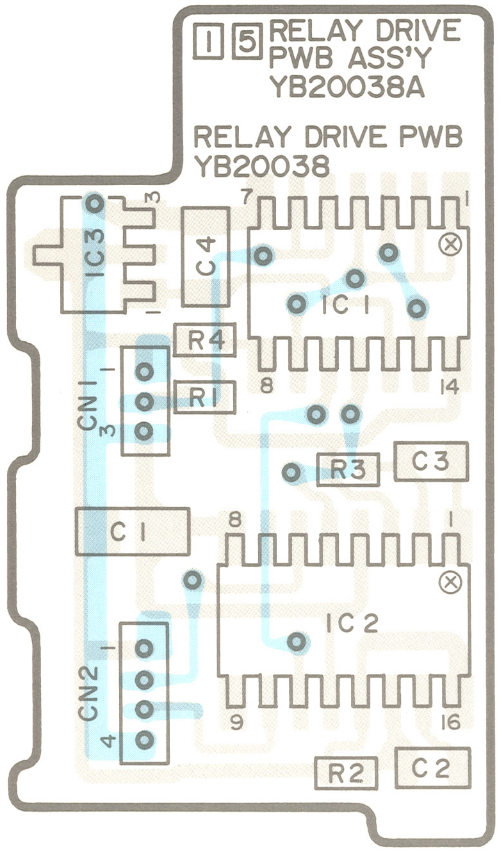

CAPSTAN MOTOR DRIVE
01 SERVO (MAIN)
15 RELAY DRIVE
IC 1 BU4011BF
IC 2 UPD45388G
IC 3 S8054HN
From/To PRE/REC AMP CN3
IC103 M52410FP
Q103 2SC408I
IC104 NJM2904E
IC106 AFZ74A002XI
IC105 VC5026G
Q127 2SB798(LK)
Q126 2SB798(LK)
37.5 Hz FILTER
PB CTL PULSE 2.5 Vp-p
VOLUME
Q107 DTA124EU
PB SWITCHING POINT
LP CTL DELAY
CAP FG (REC) 2.8 Vp-p
CAP FG (REC) 5.0 Vp-p
(REC) 2.0 Vp-p
Q131 FMG2
CAPSTAN TRAP
DRUM TRAP
LOGIC
HALL AMP
MODE AMP
TP108 PB CTL PULSE
TP107 CAP FG
TP104 CAP P/D
TP105 DRUM P/D
TP103 CTL DELAY MMV
TP106 DISCHARGE PULSE
TP101 SW A
TP102 CTL DELAY REF
TP109 TP FM
TP111 DRUM FF
4.43 MHz
X'TAL
IC101
IC102
IC107 BU4011BF
Q114 FMG2
Q111
Q113
Q120 DTC144EU
Q110 DTC144EU
Q112 DTC144EU
Q121 DTC144EU
Q130 2SC408I
CAP DIF AMP
VOLTAGE FOLLOWER
DRUM DIF AMP
DISCHARGE PULSE (REC/PB) 5.0 Vp-p
40 mVp-p
SWA 4.0 Vp-p
DRUM FF 4.0 Vp-p
SP 1,482 Hz
LP 741 Hz
TRACKING VR
Q106 TRACKING PRESET
SW LOGIC
CONTROL DELAY MMV
1,748 Hz
3,496 Hz
25 Hz
50 Hz
1,500 Hz
37.5 Hz
IC101 BU3721K
Q106 2SK665
Q113 2SK665
Q111 2SK665
IC102 M51799FP
DRUM SERVO SIGNAL PATH
CAPSTAN SERVO SIGNAL PATH


CAPSTAN MOTOR DRIVE
IC103 M52410FP
Q103 2SC4081
IC104 NJM2904E
IC106 AFZ74A002X1
IC105 VC5026G
Q127 2SB798(LK)
Q126 2SB798(LK)
Q125 2SB798(LK)
TP108 PB CTL PULSE
PB CTL PULSE 2.5 Vp-p
37.5 Hz FILTER
CAPSTAN TRAP
DRUM TRAP
30 LOGIC
HALL AMP
MODE AMP
VOLUME
Q107 DTA124EU
PB SWITCHING POINT
LP CTL DELAY
REC CONTROL AMP
REC(L)
CAP FG (REC) 2.8 Vp-p
TP107 CAP FG
D108 MA3075H
CN16
COIL 2
HG 1(−)
COIL 3
HG 2(+)
HG BIAS(+)
HG BIAS(−)
COIL 1
HG 2(−)
HG 1(+)
HG 3(−)
HG 3(+)
MR 1
MR BIAS(+)
MR 2
MR BIAS(−)
From/To CAPSTAN MOTOR
GND(SIGNAL)
REG 5V
REG 8V
From/To REGULATOR SECTION
CAP POWER UP
CAP POWER
CAP REF
GND(MOTOR)
DRUM POWER UP
TP105 DRUM P/D
Q120 DTC144EU
Q122 DTC144EU
TP104 CAP P/D
IC101
IC102
40 mVp-p
Q110 DTC144EU
Q112 DTC144EU
CAP DIF AMP
VOLTAGE FOLLOWER
6V REG
DRUM PG (REC) 4.6 Vp-p
To REGULATOR SECTION
CN5
DRUM ON
DRUM PG
DEW SENSOR
DRUM FG
NC
DRUM REF
CASSETTE SW
DRUM P ERR
END SENSOR LED
DRUM POWER
From/To DRUM MDA CN254
DISCHARGE PULSE (REC/PB) 5.0 Vp-p
DRUM DIF AMP
Q121 DTC144EU
Q130 2SC4081
SW LOGIC
TP103 CTL DELAY MMV
IC107 BU4011BF
TP106 DISCHARGE PULSE
CONTROL DELAY MMV
TP101 SW A
SWA 4.0 Vp-p
DRUM FG (REC) 4.6 Vp-p
TP109 TP FM
TP102 CTL DELAY REF
CN15
TEST 0
TEST 1
TRACK P SET
CTL DELAY
SW A
DRUM FF
TP FM
UNREG 9.6V
JIG
To MECHACON SECTION
CN11
SW B
SW D
SW C
V REC MUTE
V REC 8V
PB 5V
REC FM
PB FM
PB COL
REC COL
LP/SP
From/To PRE/REC AMP CN1
TRACKING VR
Q106
R103 TRACKING PRESET
TP111 DRUM FF
DRUM FF 4.0 Vp-p
SP 1,482 Hz
LP 741 Hz
1,500 Hz
37.5 Hz
1,748 Hz
3,496 Hz
25 Hz
PWM GEN
DRUM F/V CONV
DRUM PHASE DET
DRUM PHASE SHIFT
REF COUNTER
CAP PHASE SHIFT
CAP F/V CONV
CAP REF COUNTER
CAP PHASE DETECTOR
SYNC DET
V PULSE WIDTH COUNTER
REC CTL COUNTER
TRACKING MM
DRUM PG COUNTER
DRUM FG COUNTER
CONTROL DELAY MM
PULSE GEN
OVERLAP1 COUNTER
OVERLAP2 COUNTER
PB SW MM
INTER PHASE
SEARCH
PRESET
DRUM SERVO SIGNAL PATH
CAPSTAN SERVO SIGNAL PATH
0.3 Vp-p
IC101 BU3721K
Q106 2SK665
Q113 2SK665
Q111 2SK665
IC102 M51799FP

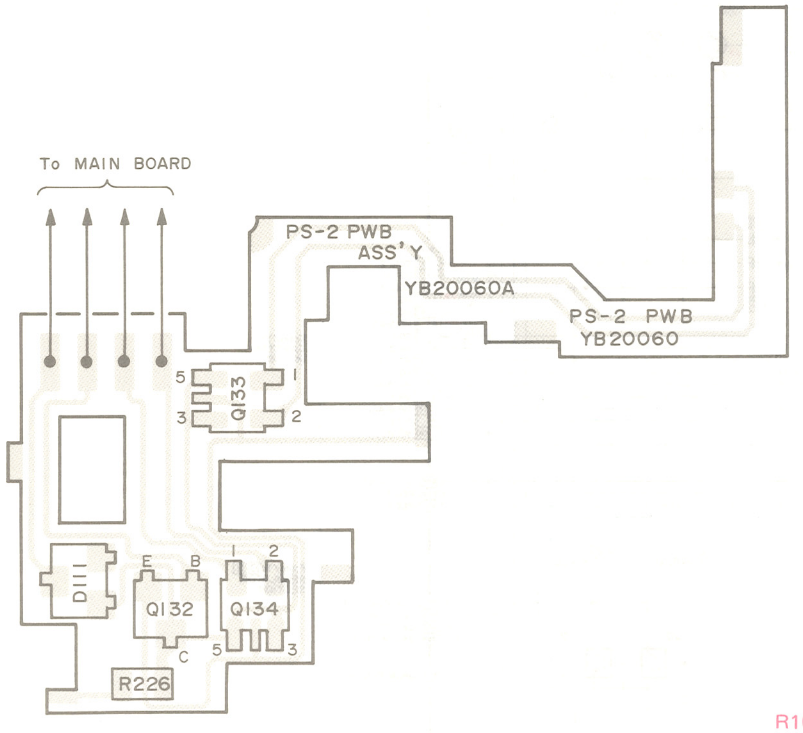

PS-2
SW A
SW B
SW C
SW D
REG 5V
R226 10K
D111 DAN202K
S MODE I
S MODE A
GND
Q133
Q134
Q132
Q132 DTC144EK
Q133, Q134 FMG2

4.16 MAIN AND RELAY DRIVE CIRCUIT BOARDS

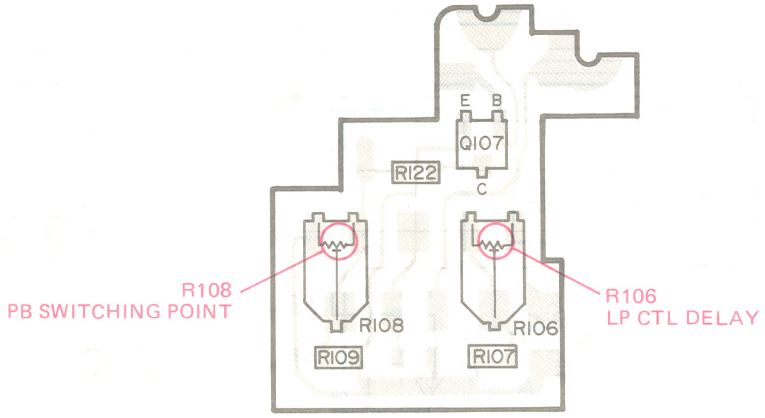
— RELAY DRIVE —


15
RELAY DRIVE PWB ASS'Y YB20038A
RELAY DRIVE PWB YB20038
IC3
C4
IC1
R4
R1
CN1
R3
C3
C1
IC2
CN2
R2
C2

— PS-2 —

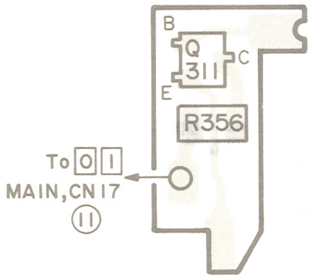

To MAIN BOARD
PS-2 PWB ASS'Y YB20060A
PS-2 PWB YB20060
Q133
D111
Q132
Q134
R226

— VOLUME —


R108
PB SWITCHING POINT
R106
LP CTL DELAY
Q107
R122
R109
R107

VOLUME PWB YB30018
VOLUME PWB ASS'Y YB30018C

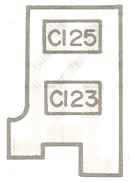
— SHORT SENS —


Q311
R356
To 01 MAIN, CN17
11

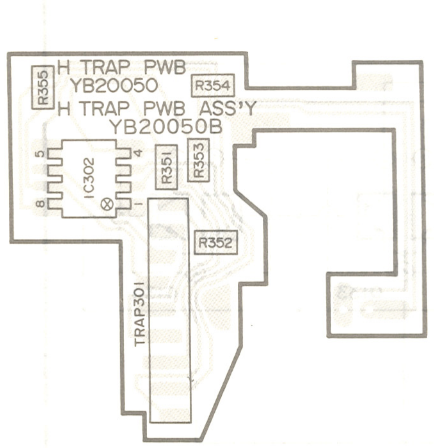
SHORT SENS PWB YB20054
SHORT SENS PWB ASS'Y YB20054A

— SW C —

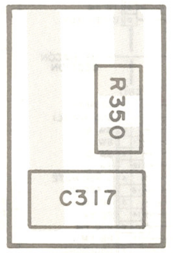
SW C PWB ASS'Y YB20059A
SW C PWB YB20059



— H. TRAP —

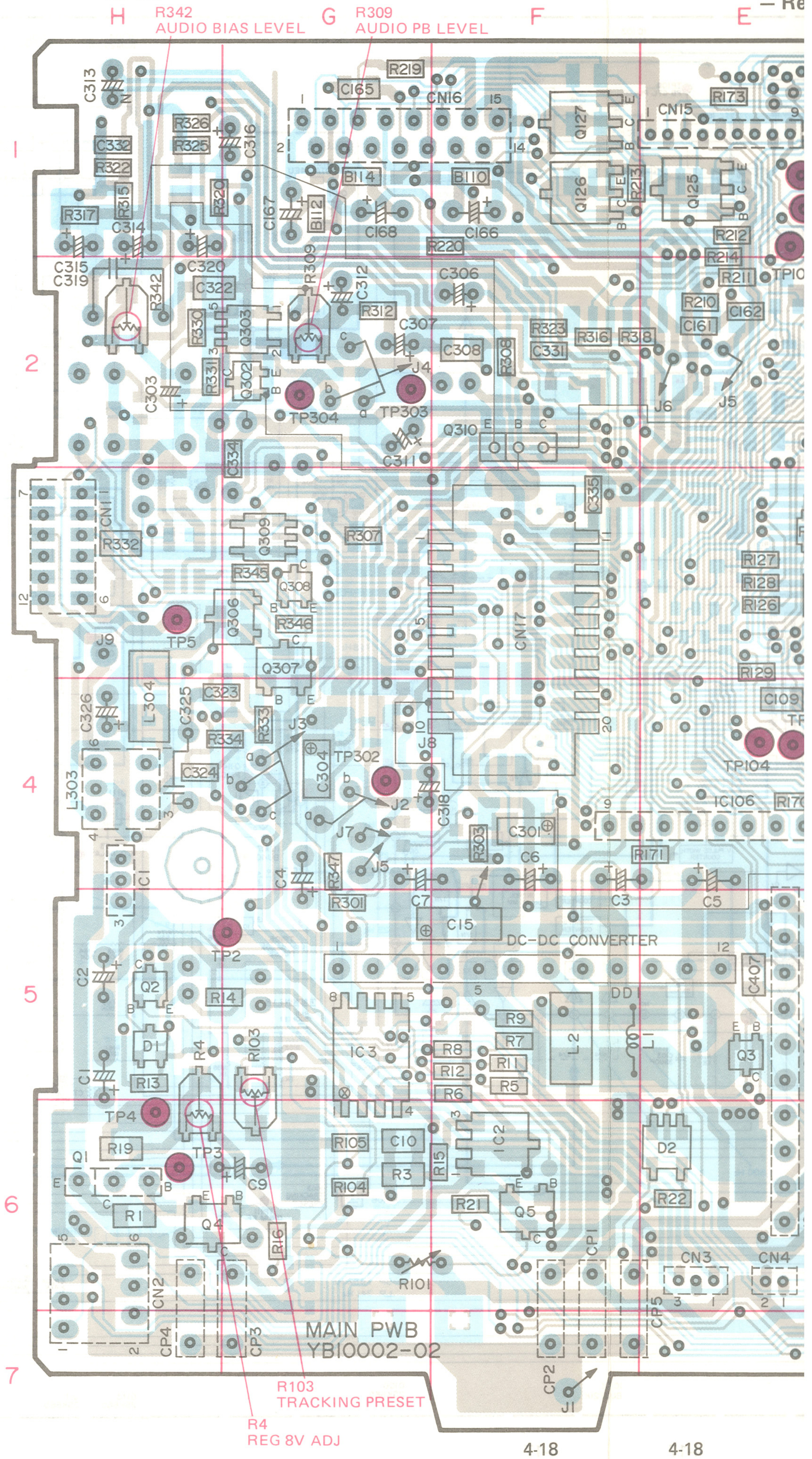

H TRAP PWB YB20050
H TRAP PWB ASS'Y YB20050B
R355
R354
IC302
R351
R353
R352
TRAP301

— BUFFER RC —

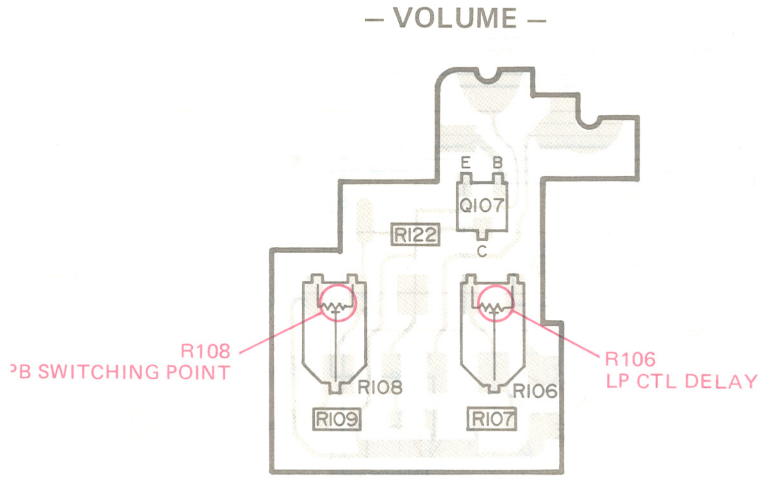


BUFFER RC PWB ASS'Y YB20049A
BUFFER RC PWB YB20049

— MAIN —


H
G
F
E
1
2
3
4
5
6
7
R342
AUDIO BIAS LEVEL
R309
AUDIO PB LEVEL
R103
TRACKING PRESET
R4
REG 8V ADJ
TP5
TP2
TP3
TP4
TP302
TP303
TP304
TP104
DC-DC CONVERTER
MAIN PWB YB10002-02
CN15
CN16
CN11
CN17
CN2
CN3
CN4
IC3
IC2
IC106
J1
CP2
CP3
CP4
CP5

-2 PWB
20060

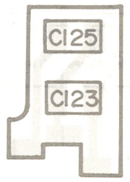

— VOLUME —
Q107
R122
R108
PB SWITCHING POINT
R106
LP CTL DELAY
R108
R106
R109
R107

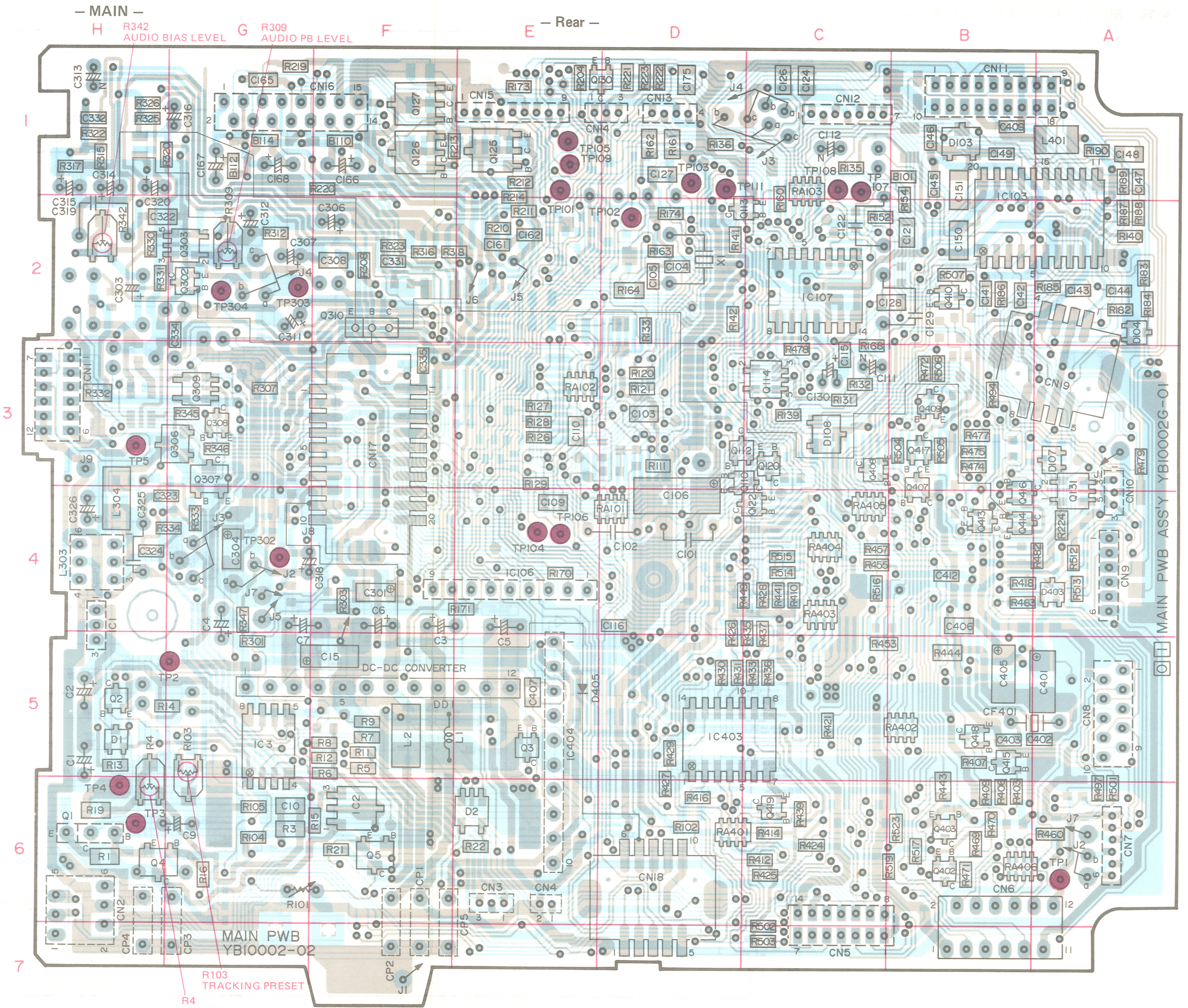
VOLUME PWB YB30018
VOLUME PWB ASS'Y YB30018C

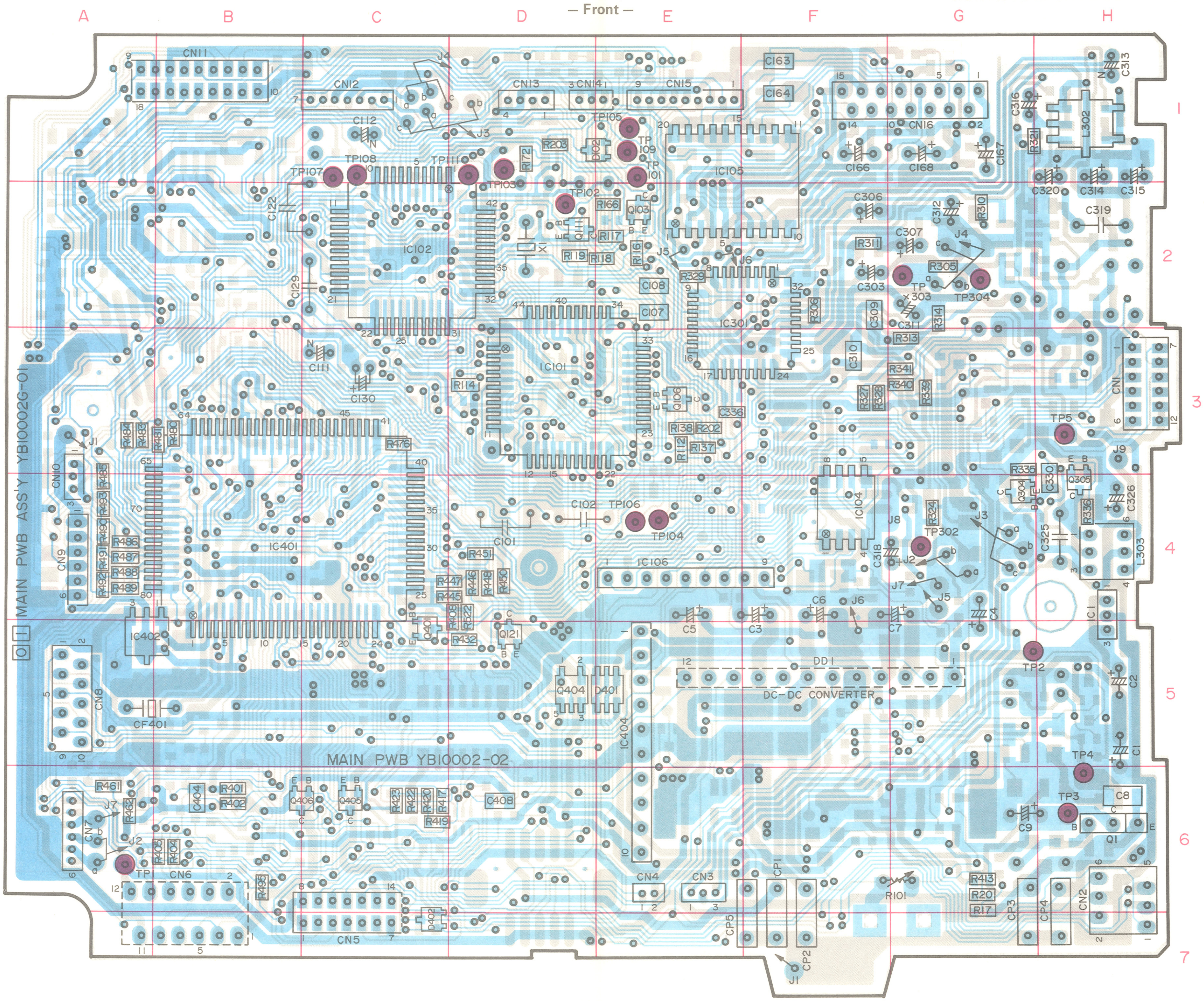
B
B ASS'Y

— SW C —

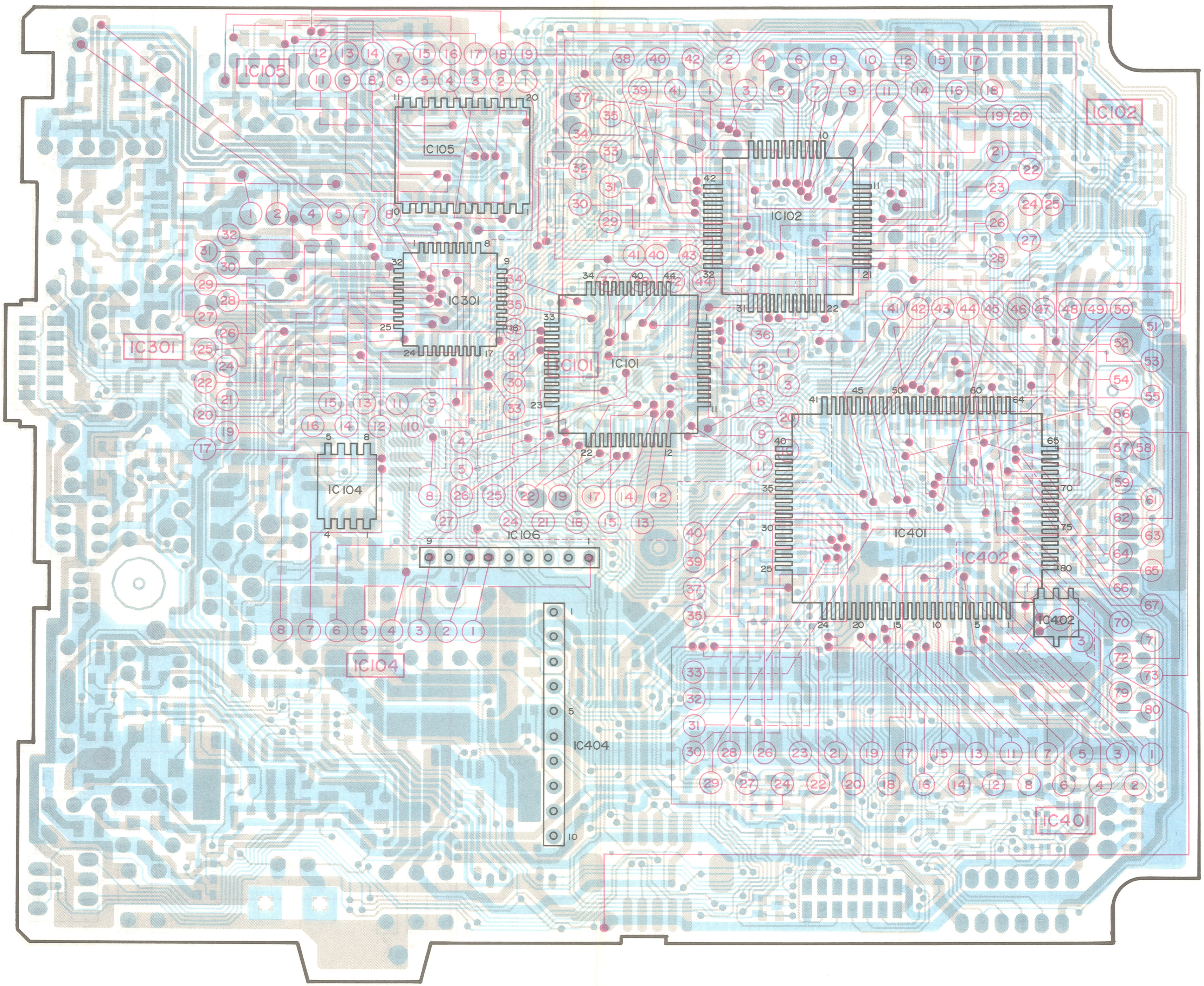
SW C PWB ASS'Y YB20059A
SW C PWB YB20059



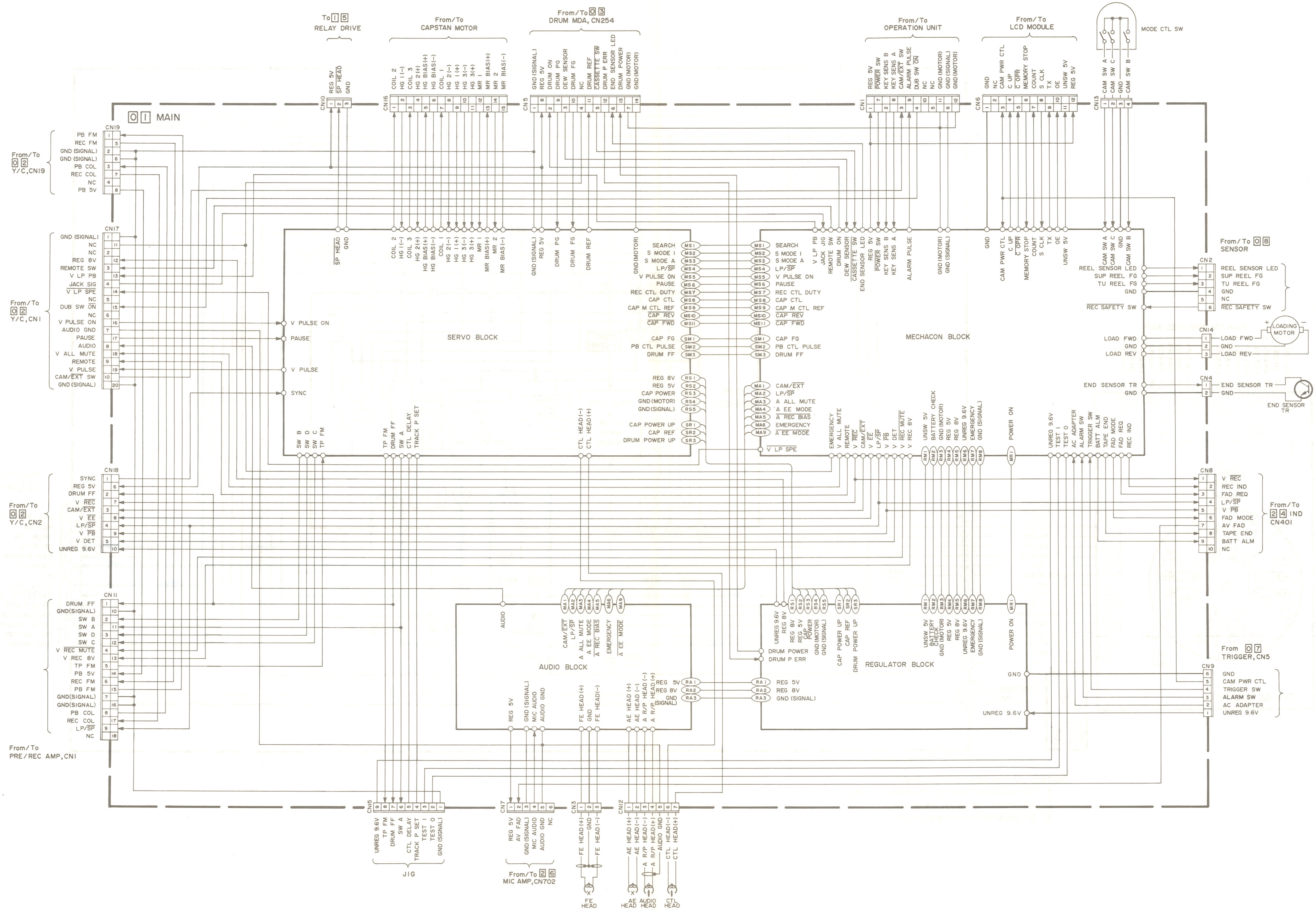

— MAIN —
— Rear —
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
R342
AUDIO BIAS LEVEL
R309
AUDIO PB LEVEL
R103
TRACKING PRESET
R4
REG 8V ADJ
DC-DC CONVERTER
MAIN PWB
YB10002-02
MAIN PWB ASS'Y YB10002G-01
IC107
IC103
IC403
IC3
IC2
IC106
IC404
CN11
CN12
CN13
CN14
CN15
CN16
CN17
CN18
CN19
TP1
TP2
TP3
TP4
TP5
TP101
TP102
TP103
TP104
TP105
TP106
TP107
TP108
TP109
TP111
TP302
TP303
TP304


— Front —
A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
MAIN PWB ASS'Y YB10002G-01
MAIN PWB YB10002-02
DC-DC CONVERTER
DD1
IC101
IC102
IC104
IC105
IC106
IC301
IC401
IC402
IC404
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN11
CN12
CN13
CN14
CN15
CN16
TP1
TP2
TP3
TP4
TP5
TP101
TP102
TP103
TP104
TP105
TP106
TP107
TP108
TP109
TP111
TP302
TP303
TP304
CF401
X1
L302
L303
Q1
Q103
Q106
Q111
Q121
Q304
Q305
Q401
Q404
Q405
Q406
D401
D402
D102
R101

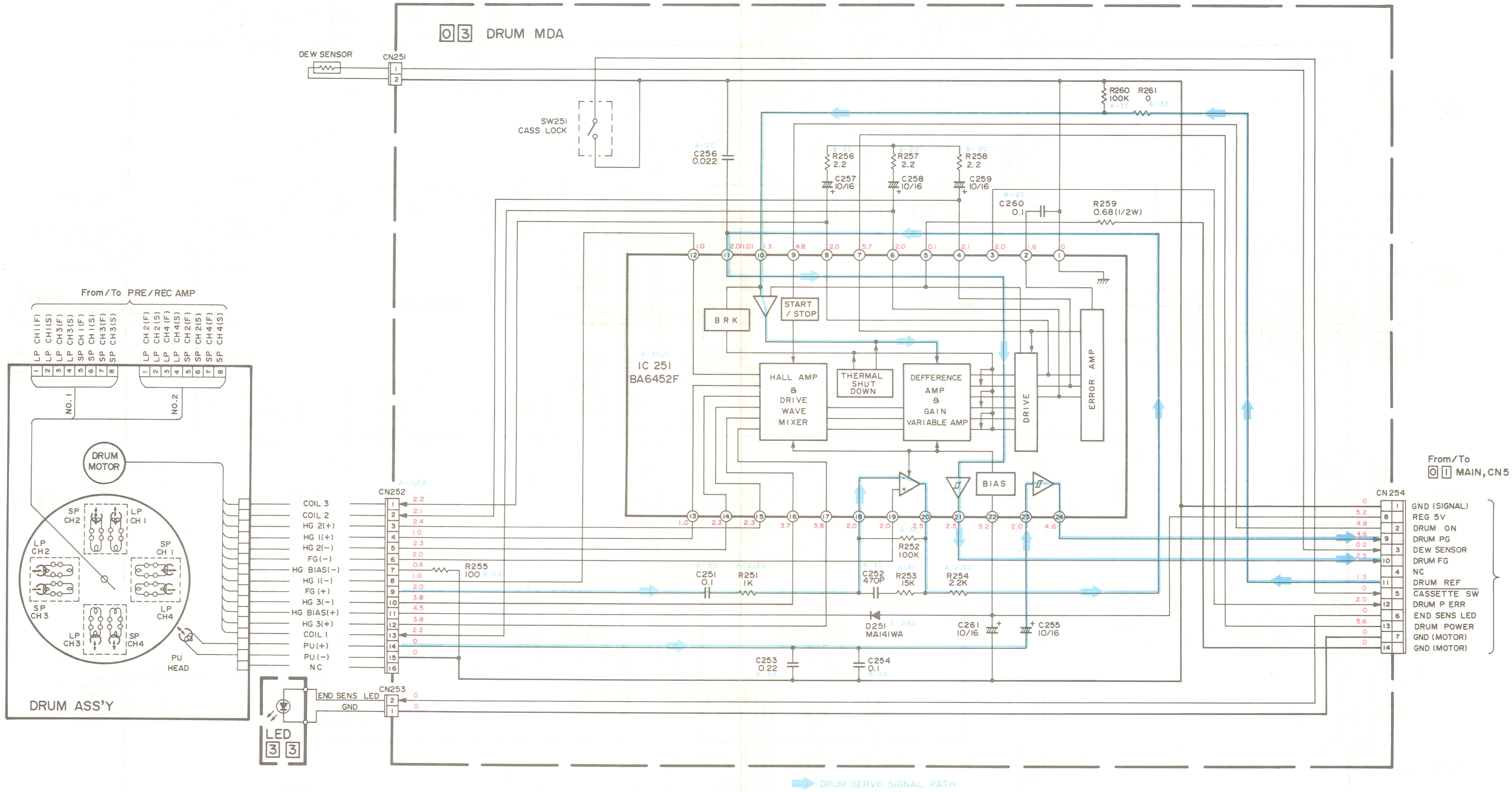
4.17 MAIN BOARD THROUGH HOLE LOCATION


IC105
IC301
IC101
IC102
IC104
IC106
IC401
IC402
IC404

4.18 MAIN BOARD OVERALL WIRING


01 MAIN
To 15 RELAY DRIVE
From/To CAPSTAN MOTOR
From/To 03 DRUM MDA, CN254
From/To OPERATION UNIT
From/To LCD MODULE
MODE CTL SW
From/To 02 Y/C,CN19
From/To 02 Y/C,CN1
From/To 02 Y/C,CN2
From/To PRE/REC AMP,CN1
From/To 08 SENSOR
From/To 24 IND CN401
From 07 TRIGGER,CN5
From/To 26 MIC AMP,CN702
JIG
FE HEAD
AE HEAD
AUDIO HEAD
CTL HEAD
LOADING MOTOR
END SENSOR TR
SERVO BLOCK
MECHACON BLOCK
AUDIO BLOCK
REGULATOR BLOCK
CN19: PB FM, REC FM, GND (SIGNAL), GND (SIGNAL), PB COL, REC COL, NC, PB 5V
CN17: GND (SIGNAL), NC, NC, REG 8V, REMOTE SW, V LP PB, JACK SIG, V LP SPE, NC, DUB SW ON, NC, V PULSE ON, AUDIO GND, PAUSE, AUDIO, V ALL MUTE, REMOTE, V PULSE, CAM/EXT SW, GND (SIGNAL)
CN18: SYNC, REG 5V, DRUM FF, V REC, CAM/EXT, V EE, LP/SP, V PB, V DET, UNREG 9.6V
CN11: DRUM FF, GND(SIGNAL), SW B, SW A, SW D, SW C, V REC MUTE, V REC 8V, TP FM, PB 5V, REC FM, PB FM, GND(SIGNAL), GND(SIGNAL), PB COL, REC COL, LP/SP, NC
CN10: REG 5V, SP HEAD, GND
CN16: COIL 2, HG 1(−), COIL 3, HG 2(+), HG BIAS(+), HG BIAS(−), COIL 1, HG 2(−), HG 1(+), HG 3(−), HG 3(+), MR 1, MR BIAS(+), MR 2, MR BIAS(−)
CN5: GND (SIGNAL), REG 5V, DRUM ON, DRUM PG, DEW SENSOR, DRUM FG, NC, DRUM REF, CASSETTE SW, DRUM P ERR, END SENSOR LED, DRUM POWER, GND (MOTOR), GND (MOTOR)
CN1: REG 5V, POWER SW, KEY SENS B, KEY SENS A, CAM/EXT SW, ALARM PULSE, DUB SW ON, NC, NC, GND (MOTOR), GND (SIGNAL), GND (MOTOR)
CN6: GND, NC, CAM PWR CTL, C UP, C OPR, MEMORY STOP, COUNT, S CLK, TX, OE, UNSW 5V, REG 5V
CN13: CAM SW A, CAM SW C, GND, CAM SW B
CN2: REEL SENSOR LED, SUP REEL FG, TU REEL FG, GND, NC, REC SAFETY SW
CN14: LOAD FWD, GND, LOAD REV
CN4: END SENSOR TR, GND
CN8: V REC, REC IND, FAD REQ, LP/SP, V PB, FAD MODE, AV FAD, TAPE END, BATT ALM, NC
CN9: GND, CAM PWR CTL, TRIGGER SW, ALARM SW, AC ADAPTER, UNREG 9.6V
CN15: UNREG 9.6V, TP FM, DRUM FF, SW A, CTL DELAY, TRACK P SET, TEST I, TEST O, GND (SIGNAL)
CN7: REG 5V, AV FAD, GND (SIGNAL), MIC AUDIO, AUDIO GND, NC
CN3: FE HEAD (+), GND, FE HEAD (−)
CN12: AE HEAD (+), AE HEAD (−), A R/P HEAD (−), A R/P HEAD (+), AUDIO GND, CTL HEAD (−), CTL HEAD (+)
MS1 SEARCH, MS2 S MODE I, MS3 S MODE A, MS4 LP/SP, MS5 V PULSE ON, MS6 PAUSE, MS7 REC CTL DUTY, MS8 CAP CTL, MS9 CAP M CTL REF, MS10 CAP REV, MS11 CAP FWD
SM1 CAP FG, SM2 PB CTL PULSE, SM3 DRUM FF
RS1 REG 8V, RS2 REG 5V, RS3 CAP POWER, RS4 GND(MOTOR), RS5 GND(SIGNAL)
SR1 CAP POWER UP, SR2 CAP REF, SR3 DRUM POWER UP
MA1 CAM/EXT, MA2 LP/SP, MA3 A ALL MUTE, MA4 A EE MODE, MA5 A REC BIAS, MA6 EMERGENCY, MA9 A EE MODE
V LP SPE
RA1 REG 5V, RA2 REG 8V, RA3 GND (SIGNAL)
RM1 UNSW 5V, RM2 BATTERY CHECK, RM3 GND (MOTOR), RM4 REG 5V, RM5 REG 8V, RM6 UNREG 9.6V, RM7 EMERGENCY, RM8 GND (SIGNAL)
MR1 POWER ON
V PULSE ON, PAUSE, V PULSE, SYNC
SW B, SW D, SW C, TP FM
TP FM, DRUM FF, SW A, CTL DELAY, TRACK P SET
CTL HEAD (−), CTL HEAD (+)
EMERGENCY, V ALL MUTE, V REMOTE, V REC, CAM/EXT, V EE, LP/SP, V PB, V DET, V REC MUTE, V REC 8V
UNREG 9.6V, TEST I, TEST O, AC ADAPTER, ALARM SW, TRIGGER SW, BATT ALM, TAPE END, FAD MODE, FAD REQ, REC IND
DRUM POWER, DRUM P ERR
AUDIO
GND, UNREG 9.6V

4.19 DRUM MDA SCHEMATIC DIAGRAM


03 DRUM MDA
DEW SENSOR
CN251
SW251 CASS LOCK
C256 0.022
R256 2.2
R257 2.2
R258 2.2
C257 10/16
C258 10/16
C259 10/16
R260 100K
R261 0
C260 0.1
R259 0.68(1/2W)
IC 251 BA6452F
BRK
START / STOP
HALL AMP & DRIVE WAVE MIXER
THERMAL SHUT DOWN
DEFFERENCE AMP & GAIN VARIABLE AMP
DRIVE
ERROR AMP
BIAS
From/To PRE/REC AMP
LP CH1(F)
LP CH1(S)
LP CH3(F)
LP CH3(S)
SP CH1(F)
SP CH1(S)
SP CH3(F)
SP CH3(S)
LP CH2(F)
LP CH2(S)
LP CH4(F)
LP CH4(S)
SP CH2(F)
SP CH2(S)
SP CH4(F)
SP CH4(S)
NO.1
NO.2
DRUM MOTOR
SP CH2
LP CH1
LP CH2
SP CH1
SP CH3
LP CH4
LP CH3
SP CH4
PU HEAD
DRUM ASS'Y
CN252
COIL 3
COIL 2
HG 2(+)
HG 1(+)
HG 2(−)
FG(−)
HG BIAS(−)
HG 1(−)
FG(+)
HG 3(−)
HG BIAS(+)
HG 3(+)
COIL 1
PU(+)
PU(−)
NC
R255 100
C251 0.1
R251 1K
C252 470P
R253 15K
R252 100K
R254 2.2K
D251 MA141WA
C261 10/16
C255 10/16
C253 0.22
C254 0.1
LED 33
END SENS LED
GND
CN253
From/To 01 MAIN, CN5
CN254
GND (SIGNAL)
REG 5V
DRUM ON
DRUM PG
DEW SENSOR
DRUM FG
NC
DRUM REF
CASSETTE SW
DRUM P ERR
END SENS LED
DRUM POWER
GND (MOTOR)
GND (MOTOR)
DRUM SERVO SIGNAL PATH

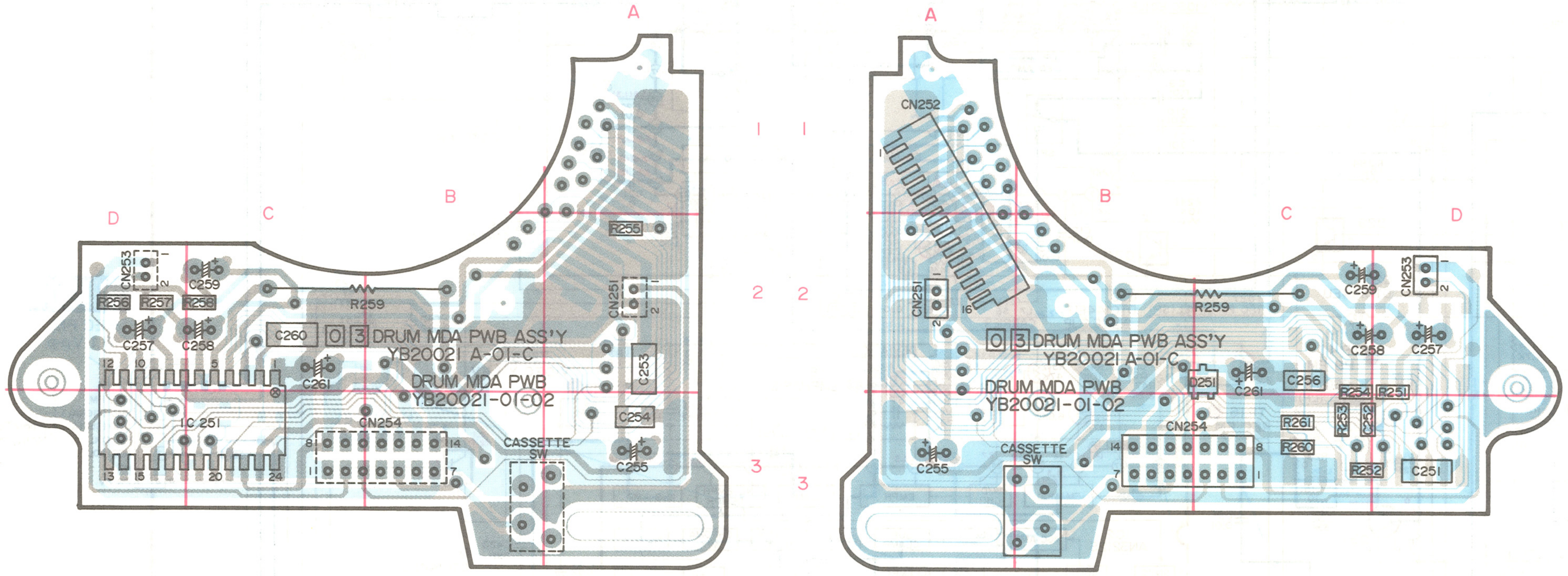
NOTES: Unless otherwise specified.

1. All resistance values are in ohms (1/16 W).
2. All inductance values are in μH.
3. All capacitance values are in μF.

4.20 DRUM MDA & UPPER DRUM CIRCUIT BOARDS

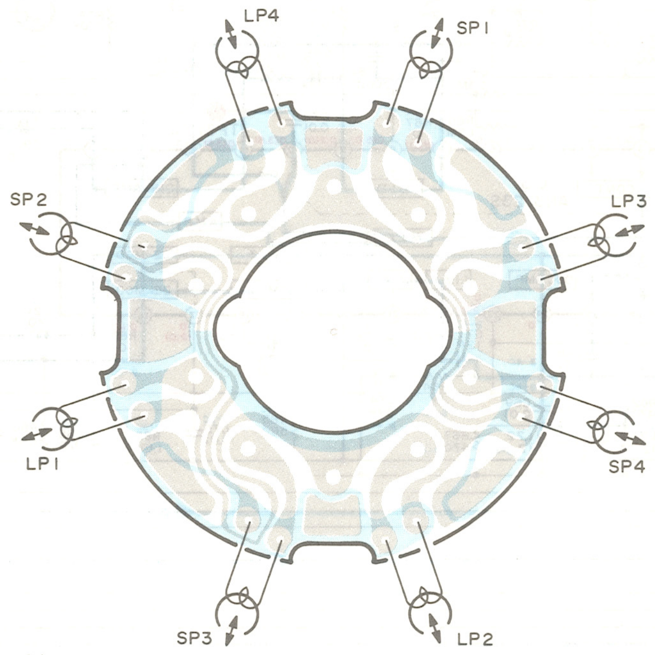
4.21 MIC AMP, JACK, MIC JACK & TRIGGER CIRCUIT BOARDS

— DRUM MDA —


—Rear —

— Front —
A
B
C
D
1
2
3
CN253
C259
R256
R257
R258
C257
C258
R259
R255
CN251
C260
03 DRUM MDA PWB ASS'Y
YB20021 A-01-C
DRUM MDA PWB
YB20021-01-02
C261
C253
C254
IC 251
CN254
CASSETTE SW
C255
CN252
D251
C256
R261
R260
R254
R251
R253
C252
R252
C251

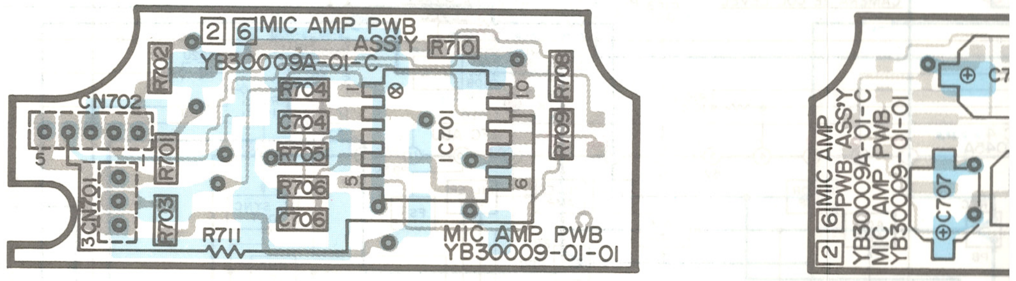
— UPPER DRUM —


LP4
SP1
SP2
LP3
LP1
SP4
SP3
LP2

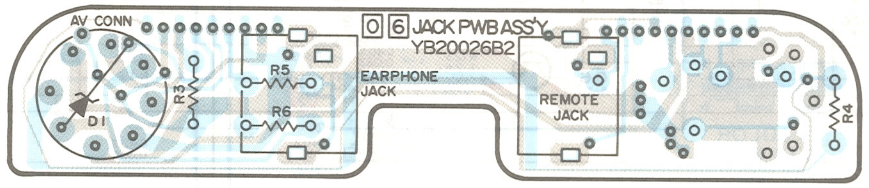
Note: This circuit board is included in upper drum assembly.

— MIC AMP —

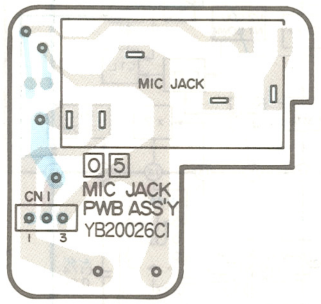
— Rear —


26 MIC AMP PWB ASS'Y
YB30009A-01-C
R710
R702
CN702
R701
R704
C704
R705
R706
C706
R703
CN701
R711
IC701
R708
R709
MIC AMP PWB
YB30009-01-01
C707
26 MIC AMP PWB ASS'Y
YB30009A-01-C
MIC AMP PWB
YB30009-01-01

— JACK —


AV CONN
06 JACK PWB ASS'Y
YB20026B2
R3
R5
R6
D1
EARPHONE JACK
REMOTE JACK
R4

— MIC JACK —

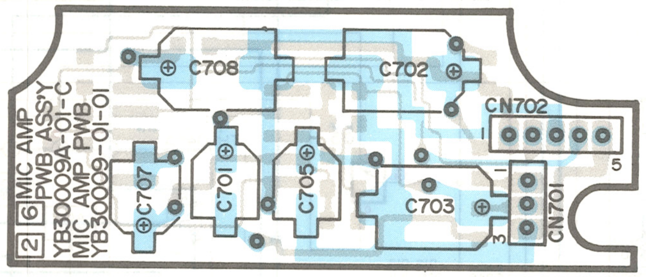

MIC JACK
CN1
05 MIC JACK PWB ASS'Y
YB20026C1

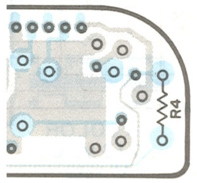
— T

4.22 MIC JACK & MIC AMP SCHEMATIC DIAGRAM

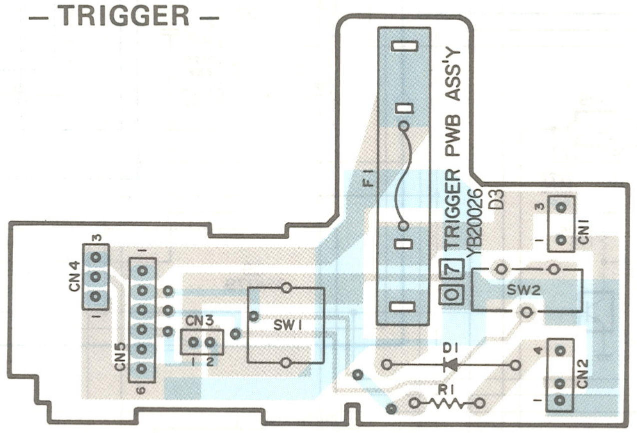
– MIC AMP –

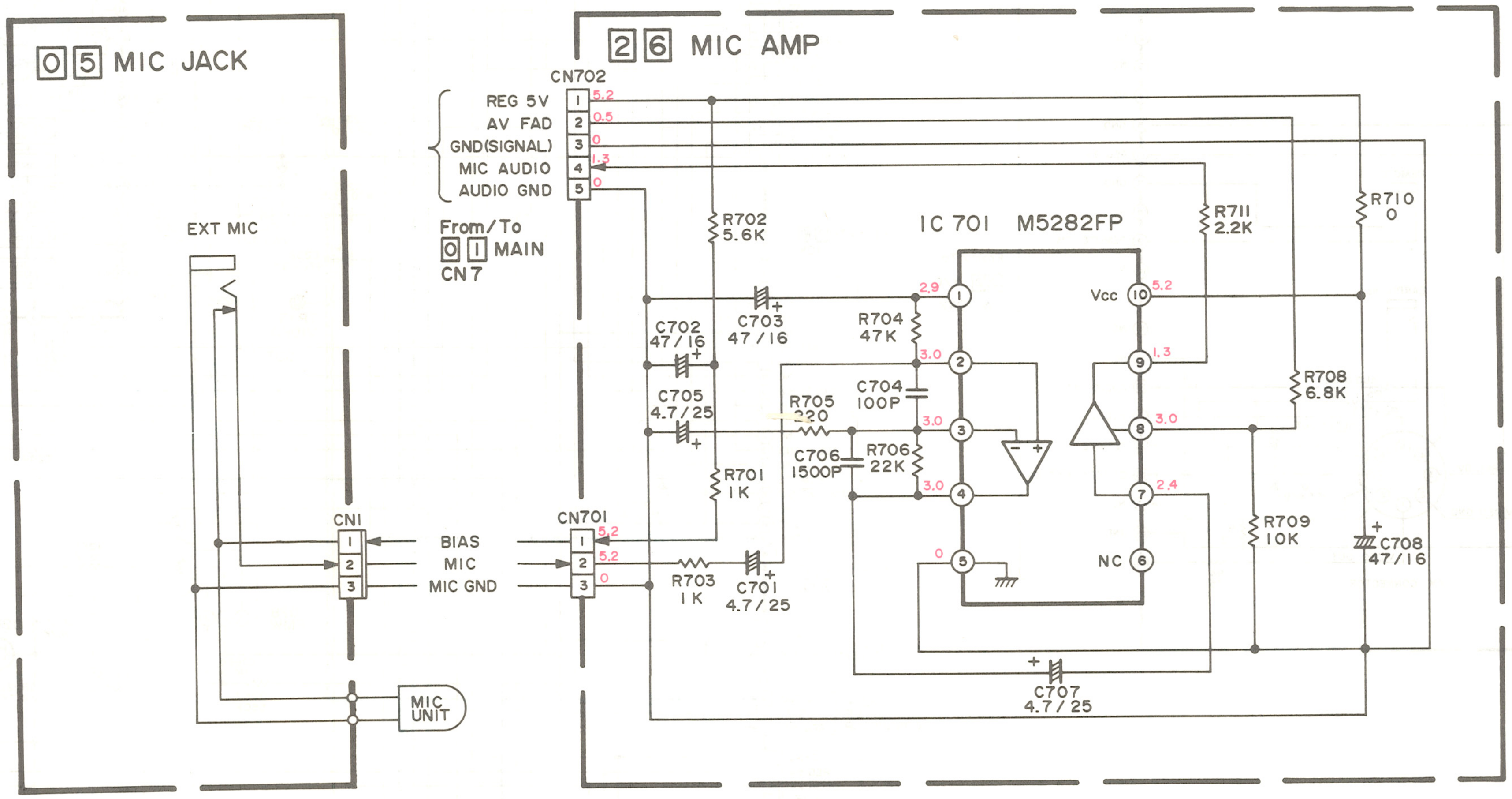
– Front –


C708
C702
CN702
1
5
C707
C701
C705
C703
CN701
3
2 6 MIC AMP
PWB ASS'Y
YB30009A-01-C
MIC AMP PWB
YB30009-01-01

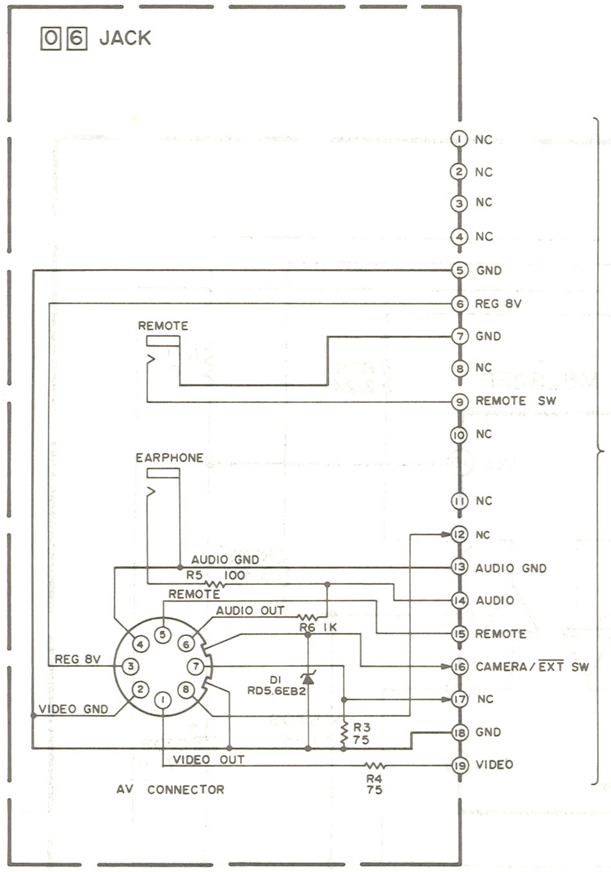


– TRIGGER –

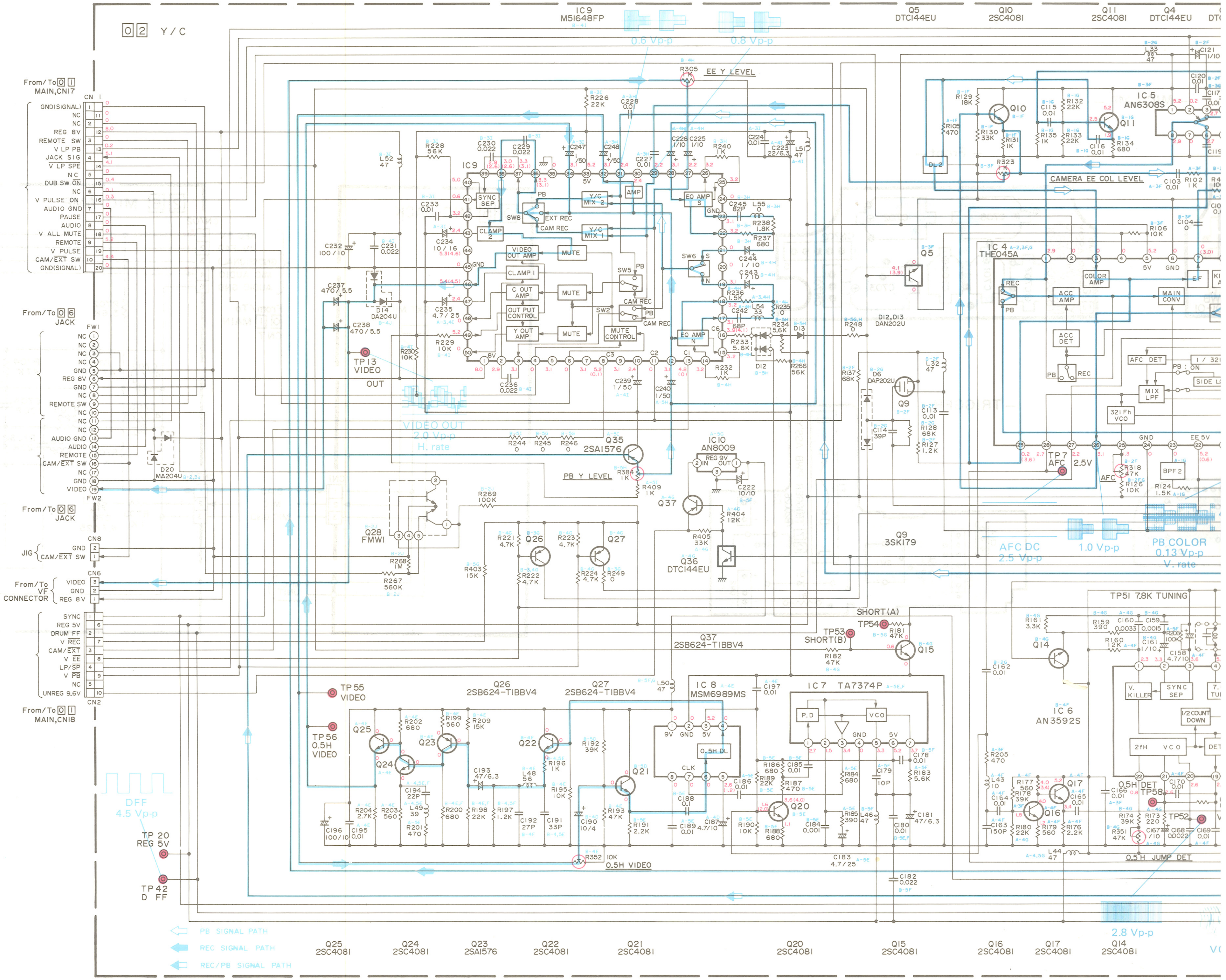

F1
TRIGGER PWB ASS'Y
0 7
YB20026
D3
CN1
CN4
CN5
CN3
SW1
SW2
D1
R1
CN2

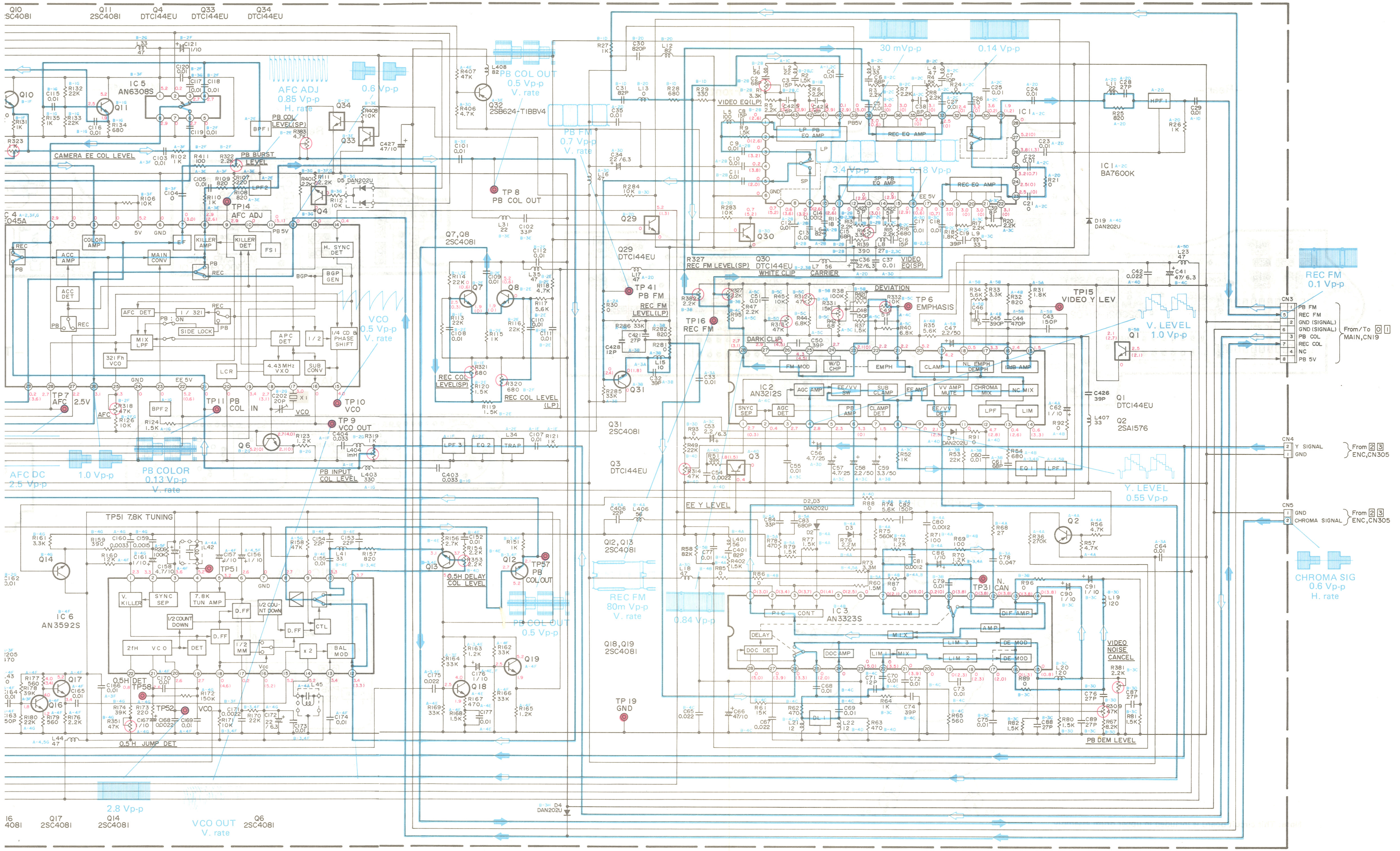

0 5 MIC JACK
EXT MIC
CN1
BIAS
MIC
MIC GND
MIC UNIT
2 6 MIC AMP
CN702
REG 5V
AV FAD
GND(SIGNAL)
MIC AUDIO
AUDIO GND
From/To
0 1 MAIN
CN7
CN701
R702 5.6K
C702 47/16
C703 47/16
C705 4.7/25
R701 1K
R703 1K
C701 4.7/25
R704 47K
C704 100P
R705 220
C706 1500P
R706 22K
IC 701 M5282FP
Vcc
NC
R711 2.2K
R710 0
R708 6.8K
R709 10K
C708 47/16
C707 4.7/25
5.2
0.5
0
1.3
2.9
3.0
2.4

4.23 JACK SCHEMATIC DIAGRAM


06 JACK
REMOTE
EARPHONE
AUDIO GND
R5 100
REMOTE
AUDIO OUT
R6 1K
REG 8V
VIDEO GND
D1 RD5.6EB2
R3 75
VIDEO OUT
R4 75
AV CONNECTOR
1 NC
2 NC
3 NC
4 NC
5 GND
6 REG 8V
7 GND
8 NC
9 REMOTE SW
10 NC
11 NC
12 NC
13 AUDIO GND
14 AUDIO
15 REMOTE
16 CAMERA/EXT SW
17 NC
18 GND
19 VIDEO
From/To 02 Y/C FW1, FW2

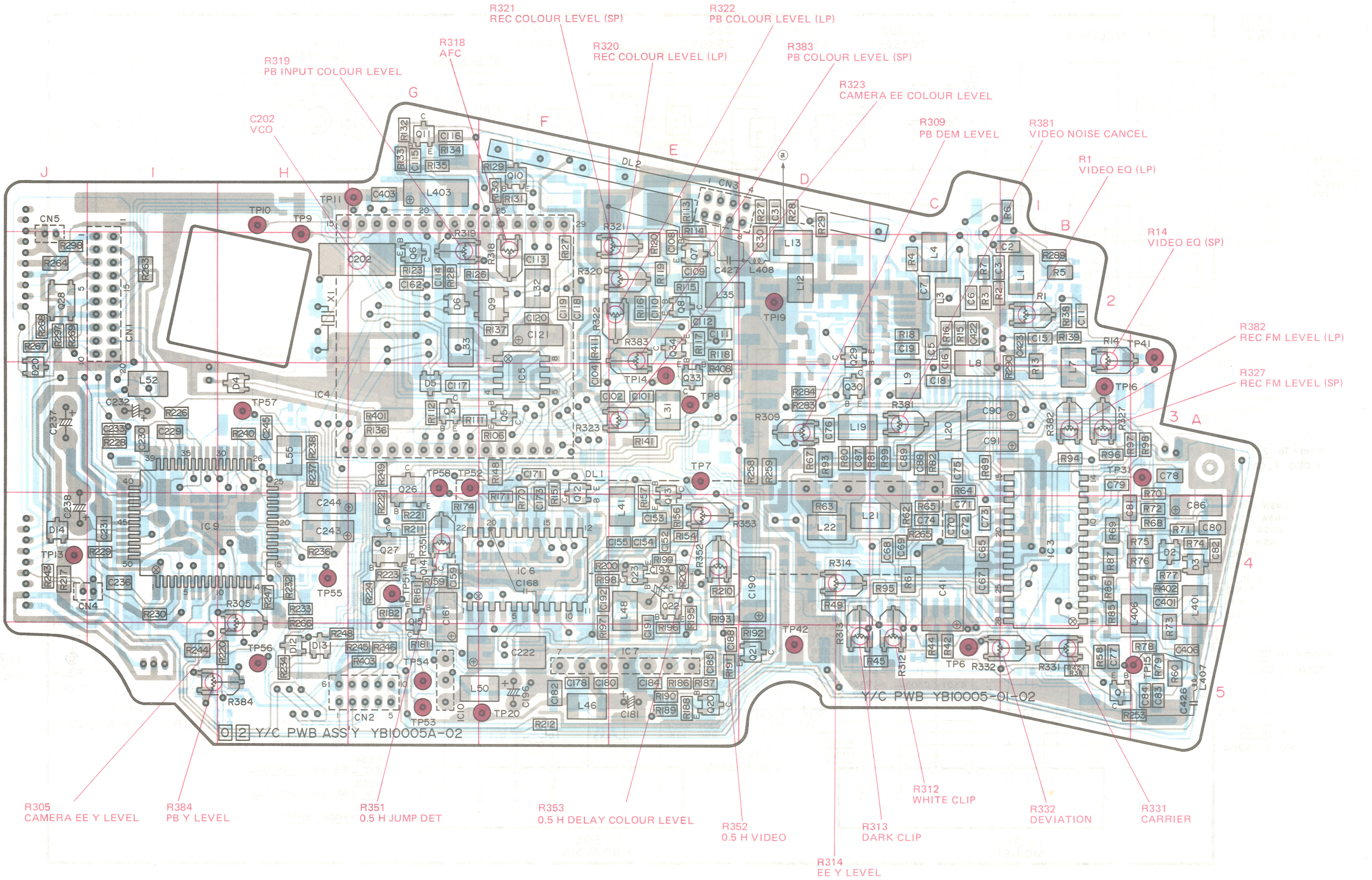
4.24 Y/C SCHEMATIC DIAGRAM


02 Y/C
From/To 01 MAIN, CN17
From/To 06 JACK
From/To 06 JACK
JIG
From/To VF CONNECTOR
From/To 01 MAIN, CN18
IC9 M51648FP
0.6 Vp-p
0.8 Vp-p
EE Y LEVEL
Q5 DTC144EU
Q10 2SC4081
Q11 2SC4081
Q4 DTC144EU
IC5 AN6308S
CAMERA EE COL LEVEL
IC4 THE045A
TP13 VIDEO OUT
VIDEO OUT 2.0 Vp-p H. rate
Q35 2SA1576
IC10 AN8009
PB Y LEVEL
Q37
Q36 DTC144EU
Q28 FMW1
Q26
Q27
Q9 3SK179
D12, D13 DAN202U
D6 DAP202U
D14 DA204U
D20 MA204U
AFC DC 2.5 Vp-p
1.0 Vp-p
PB COLOR 0.13 Vp-p V. rate
TP7 AFC 2.5V
TP51 7.8K TUNING
SHORT(A) TP54
TP53 SHORT(B)
Q15
Q14
Q37 2SB624-T1BBV4
Q26 2SB624-T1BBV4
Q27 2SB624-T1BBV4
IC8 MSM6989MS
IC7 TA7374P
IC6 AN3592S
TP55 VIDEO
TP56 0.5H VIDEO
0.5H VIDEO
0.5H JUMP DET
TP58
TP52
DFF 4.5 Vp-p
TP20 REG 5V
TP42 D FF
2.8 Vp-p
PB SIGNAL PATH
REC SIGNAL PATH
REC/PB SIGNAL PATH
Q25 2SC4081
Q24 2SC4081
Q23 2SA1576
Q22 2SC4081
Q21 2SC4081
Q20 2SC4081
Q15 2SC4081
Q16 2SC4081
Q17 2SC4081
Q14 2SC4081


Q10 2SC4081
Q11 2SC4081
Q4 DTC144EU
Q33 DTC144EU
Q34 DTC144EU
IC5 AN6308S
CAMERA EE COL LEVEL
AFC ADJ 0.85 Vp-p H. rate
0.6 Vp-p
PB COL LEVEL(SP)
PB BURST LEVEL
TP14 AFC ADJ
TP8 PB COL OUT
Q32 2SB624-T1BBV4
PB COL OUT 0.5 Vp-p V. rate
PB FM 0.7 Vp-p V. rate
30 mVp-p
0.14 Vp-p
VIDEO EQ(LP)
LP PB EQ AMP
REC EQ AMP
SP PB EQ AMP
3.4 Vp-p
0.18 Vp-p
IC1 BA7600K
HPF1
Q29 DTC144EU
Q30 DTC144EU
R327 REC FM LEVEL(SP)
WHITE CLIP
CARRIER
VIDEO EQ(SP)
REC FM 0.1 Vp-p
Q7,Q8 2SC4081
TP41 PB FM
REC FM LEVEL(LP)
TP16 REC FM
DEVIATION
TP6 EMPHASIS
TP15 VIDEO Y LEV
V. LEVEL 1.0 Vp-p
Q1 DTC144EU
Q2 2SA1576
CN3
PB FM
REC FM
GND (SIGNAL)
GND (SIGNAL)
PB COL
REC COL
NC
PB 5V
From/To 01 MAIN,CN19
IC2 AN3212S
DARK CLIP
FM MOD
W/D CHP
EMPH
CLAMP
NL EMPH DEMPH
12dB AMP
AGC AMP
EE/VV SW
SUB CLAMP
EE AMP
VV AMP MUTE
CHROMA MIX
NC MIX
SYNC SEP
AGC DET
PB AMP
CLAMP DET
EE/VV DET
LPF
LIM
EQ1
LPF1
CN4
Y SIGNAL
GND
From 2 3 ENC,CN305
Y. LEVEL 0.55 Vp-p
EE Y LEVEL
Q31 2SC4081
Q3 DTC144EU
IC4 AN3215S
REC
PB
COLOR AMP
ACC AMP
ACC DET
MAIN CONV
KILLER AMP
KILLER DET
FS1
H. SYNC DET
BGP GEN
AFC DET
1/321
PB : ON
SIDE LOCK
MIX LPF
APC DET
1/2
1/4 CD B PHASE SHIFT
321 Fh VCO
LCR
4.43MHz VXO
SUB CONV
VCO 0.5 Vp-p V. rate
TP7 AFC
TP11 PB COL IN
TP10 VCO
TP9 VCO OUT
REC COL LEVEL(SP)
REC COL LEVEL (LP)
LPF3
EQ2
TRAP
PB INPUT COL LEVEL
AFC DC 2.5 Vp-p
1.0 Vp-p
PB COLOR 0.13 Vp-p V. rate
TP51 7.8K TUNING
Q14
IC6 AN3592S
V. KILLER
SYNC SEP
7.8K TUN AMP
1/2 COUNT DOWN
D.FF
1/2 COUNT DOWN
CTL
2fH
VCO
DET
1/2 MM
x2
BAL MOD
0.5H DET TP58
TP52
VCO
0.5H JUMP DET
Q17
Q16
Q13
Q12
0.5H DELAY COL LEVEL
TP57 PB COL OUT
PB COL OUT 0.5 Vp-p
Q18
Q19
Q12,Q13 2SC4081
Q18,Q19 2SC4081
REC FM 80m Vp-p V. rate
0.84 Vp-p
TP19 GND
D2,D3 DAN202U
IC3 AN3323S
P/C CONT
LIM
DIF AMP
MIX
AMP
DELAY
DOC DET
DOC AMP
LIM1
LIM3
LIM2
DE MOD
DL1
TP31 N. CAN
VIDEO NOISE CANCEL
PB DEM LEVEL
CN5
GND
CHROMA SIGNAL
CHROMA SIG 0.6 Vp-p H. rate
2.8 Vp-p
VCO OUT V. rate
Q16 2SC4081
Q17 2SC4081
Q14 2SC4081
Q6 2SC4081
D4 DAN202U

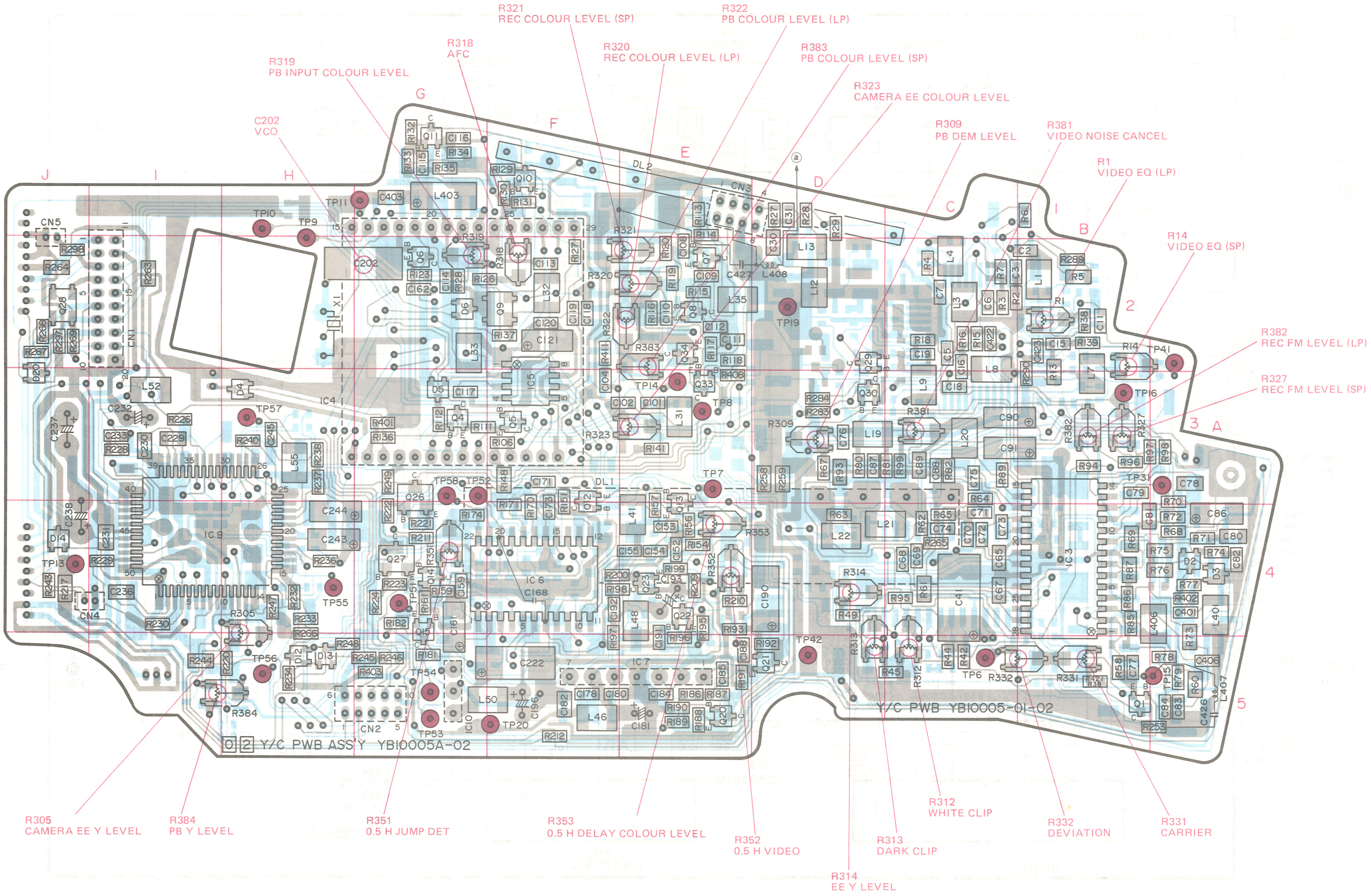
4.25 Y/C CIRCUIT BOARD

— Rear —

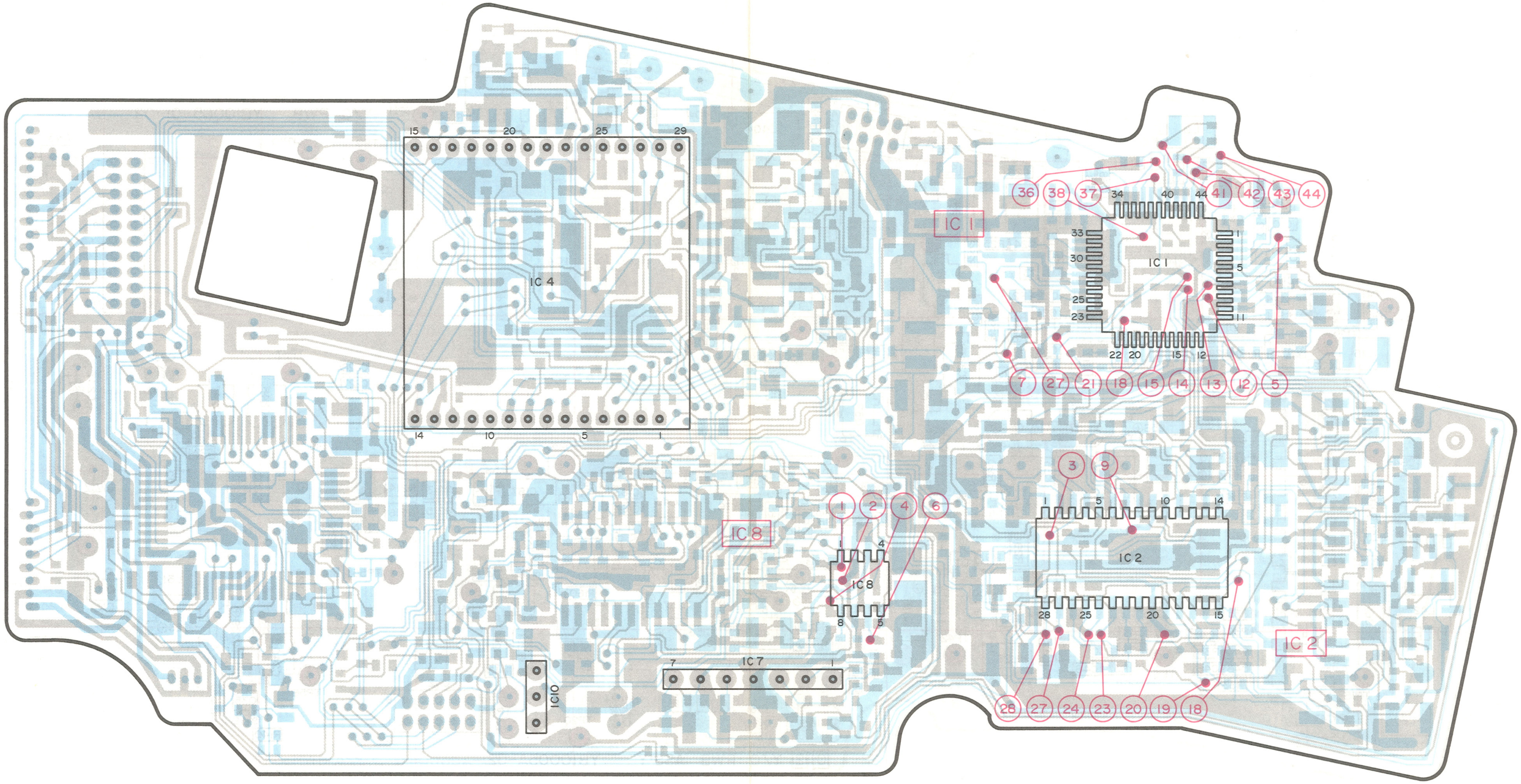

R321
REC COLOUR LEVEL (SP)
R322
PB COLOUR LEVEL (LP)
R318
AFC
R320
REC COLOUR LEVEL (LP)
R383
PB COLOUR LEVEL (SP)
R319
PB INPUT COLOUR LEVEL
R323
CAMERA EE COLOUR LEVEL
C202
VCO
R309
PB DEM LEVEL
R381
VIDEO NOISE CANCEL
R1
VIDEO EQ (LP)
R14
VIDEO EQ (SP)
R382
REC FM LEVEL (LP)
R327
REC FM LEVEL (SP)
R305
CAMERA EE Y LEVEL
R384
PB Y LEVEL
R351
0.5 H JUMP DET
R353
0.5 H DELAY COLOUR LEVEL
R352
0.5 H VIDEO
R314
EE Y LEVEL
R313
DARK CLIP
R312
WHITE CLIP
R332
DEVIATION
R331
CARRIER
Y/C PWB YB10005-01-02
02 Y/C PWB ASS'Y YB10005A-02
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5

4.25 Y/C CIRCUIT BOARD

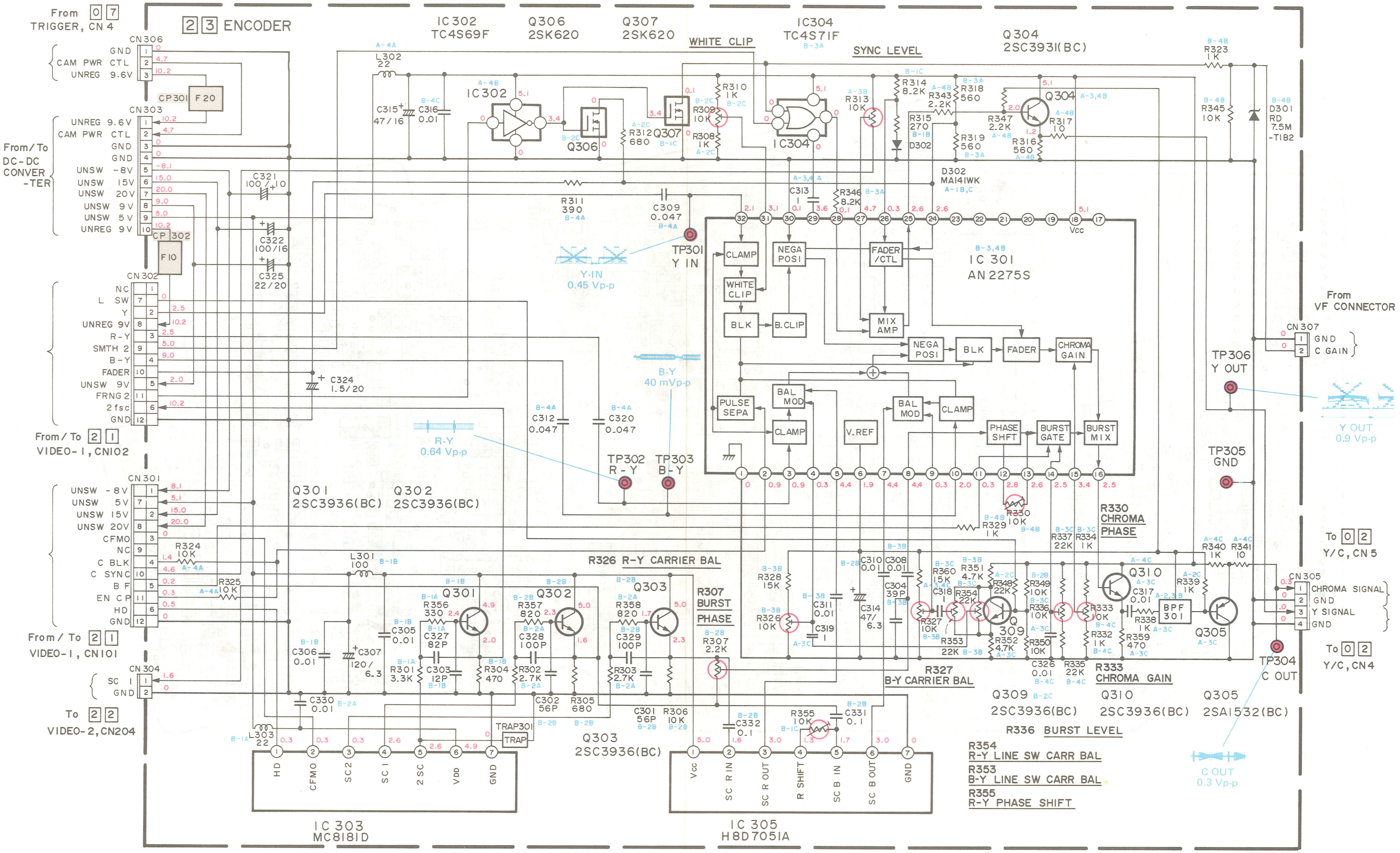
— Rear —


R321
REC COLOUR LEVEL (SP)
R322
PB COLOUR LEVEL (LP)
R318
AFC
R320
REC COLOUR LEVEL (LP)
R383
PB COLOUR LEVEL (SP)
R319
PB INPUT COLOUR LEVEL
R323
CAMERA EE COLOUR LEVEL
C202
VCO
R309
PB DEM LEVEL
R381
VIDEO NOISE CANCEL
R1
VIDEO EQ (LP)
R14
VIDEO EQ (SP)
R382
REC FM LEVEL (LP)
R327
REC FM LEVEL (SP)
R305
CAMERA EE Y LEVEL
R384
PB Y LEVEL
R351
0.5 H JUMP DET
R353
0.5 H DELAY COLOUR LEVEL
R352
0.5 H VIDEO
R314
EE Y LEVEL
R313
DARK CLIP
R312
WHITE CLIP
R332
DEVIATION
R331
CARRIER
02 Y/C PWB ASS'Y YB10005A-02
Y/C PWB YB10005-01-02
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5

4.26 Y/C BOARD THROUGH HOLE LOCATION


IC 4
15
20
25
29
14
10
5
1
IC 1
36
38
37
34
40
44
41
42
43
44
33
30
25
23
1
5
11
22
20
15
12
7
27
21
18
15
14
13
12
5
IC 8
1
2
4
6
4
8
5
IC 2
3
9
1
5
10
14
28
25
20
15
28
27
24
23
20
19
18
IC 7
7
1
IC10

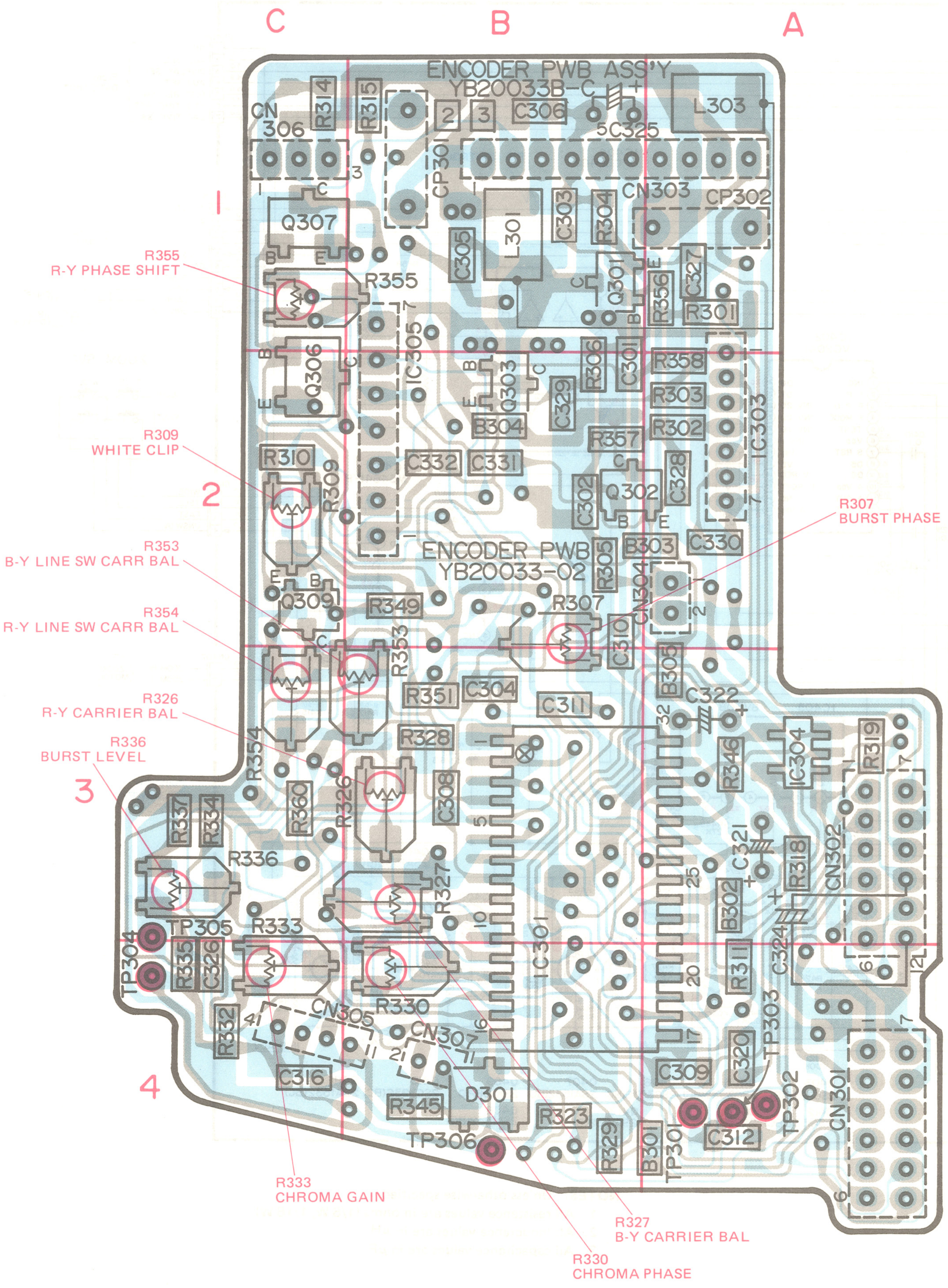
4.27 ENCORDER SCHEMATIC DIAGRAM



From 07 TRIGGER, CN4
23 ENCODER
CN306
GND
CAM PWR CTL
UNREG 9.6V
CP301 F20
CN303
UNREG 9.6V
CAM PWR CTL
GND
GND
UNSW -8V
UNSW 15V
UNSW 20V
UNSW 9V
UNSW 5V
UNREG 9V
From/To DC-DC CONVER-TER
CP302 F10
CN302
NC
L SW
Y
UNREG 9V
R-Y
SMTH 2
B-Y
FADER
UNSW 9V
FRNG 2
2fsc
GND
From/To 21 VIDEO-1, CN102
CN301
UNSW -8V
UNSW 5V
UNSW 15V
UNSW 20V
CFMO
NC
C BLK
C SYNC
B F
EN C P
HD
GND
From/To 21 VIDEO-1, CN101
CN304
SC
GND
To 22 VIDEO-2, CN204
IC302 TC4S69F
Q306 2SK620
Q307 2SK620
WHITE CLIP
IC304 TC4S71F
SYNC LEVEL
Q304 2SC3931(BC)
L302 22
C315 47/16
C316 0.01
R310 1K
R309 10K
R308 1K
R312 680
R313 10K
R314 8.2K
R343 2.2K
R318 560
R315 270
D302
R319 560
R347 2.2K
R317 10
R316 560
R323 1K
R345 10K
D301 RD7.5M-T1B2
D302 MA141WK
C321 100/10
C322 100/16
C325 22/20
C324 1.5/20
R311 390
C309 0.047
C313 1
R346 8.2K
TP301 Y IN
Y-IN 0.45 Vp-p
IC301 AN2275S
CLAMP
NEGA POSI
FADER /CTL
WHITE CLIP
BLK
B.CLIP
MIX AMP
NEGA POSI
BLK
FADER
CHROMA GAIN
BAL MOD
PULSE SEPA
BAL MOD
CLAMP
CLAMP
V.REF
PHASE SHFT
BURST GATE
BURST MIX
B-Y 40 mVp-p
R-Y 0.64 Vp-p
C312 0.047
C320 0.047
TP302 R-Y
TP303 B-Y
From VF CONNECTOR
CN307
GND
C GAIN
TP306 Y OUT
Y OUT 0.9 Vp-p
TP305 GND
Q301 2SC3936(BC)
Q302 2SC3936(BC)
R330 CHROMA PHASE
R329 1K
R330 10K
R337 22K
R334 1K
R340 1K
R341 10
To 02 Y/C, CN5
R324 10K
R325 10K
L301 100
R326 R-Y CARRIER BAL
Q303
R307 BURST PHASE
R328 15K
C310 0.01
C308 0.01
C304 39P
R360 15K
R351 4.7K
C318
R354 22K
R348 22K
R349 10K
Q310
R339 1K
C317 0.01
BPF 301
R338 1K
CN305
CHROMA SIGNAL
GND
Y SIGNAL
GND
R356 330
R357 820
R358 820
C305 0.01
C327 82P
C328 100P
C329 100P
C306 0.01
C307 120/6.3
R301 3.3K
C303 12P
R304 470
R302 2.7K
R303 2.7K
R307 2.2K
R326 10K
C311 0.01
C314 47/6.3
C319 1
R327 10K
R353 22K
R352 4.7K
R350 10K
R336 10K
R333 10K
R332 1K
R359 470
Q309
Q305
TP304 C OUT
To 02 Y/C, CN4
C330 0.01
L303 22
TRAP301 TRAP
C302 56P
R305 680
Q303 2SC3936(BC)
C301 56P
R306 10K
C332 0.1
R355 10K
C331 0.1
R327 B-Y CARRIER BAL
C326 0.01
R335 22K
R333 CHROMA GAIN
Q309 2SC3936(BC)
Q310 2SC3936(BC)
Q305 2SA1532(BC)
R336 BURST LEVEL
R354 R-Y LINE SW CARR BAL
R353 B-Y LINE SW CARR BAL
R355 R-Y PHASE SHIFT
C OUT 0.3 Vp-p
HD
CFMO
SC2
SC1
2SC
VDD
GND
IC303 MC8181D
Vcc
SC R IN
SC R OUT
R SHIFT
SC B IN
SC B OUT
GND
IC305 H8D7051A

4.28 ENCORDER CIRCUIT BOARD

— Rear —


C
B
A
1
2
3
4
ENCODER PWB ASS'Y
YB20033B-C
ENCODER PWB
YB20033-02
CN306
CN303
CP302
CP301
IC305
IC303
IC304
IC301
CN302
CN301
CN304
CN305
CN307
Q307
Q306
Q303
Q301
Q302
Q309
L303
L301
D301
TP301
TP302
TP303
TP304
TP305
TP306

R355
R-Y PHASE SHIFT

R309
WHITE CLIP

R353
B-Y LINE SW CARR BAL

R354
R-Y LINE SW CARR BAL

R326
R-Y CARRIER BAL

R336
BURST LEVEL

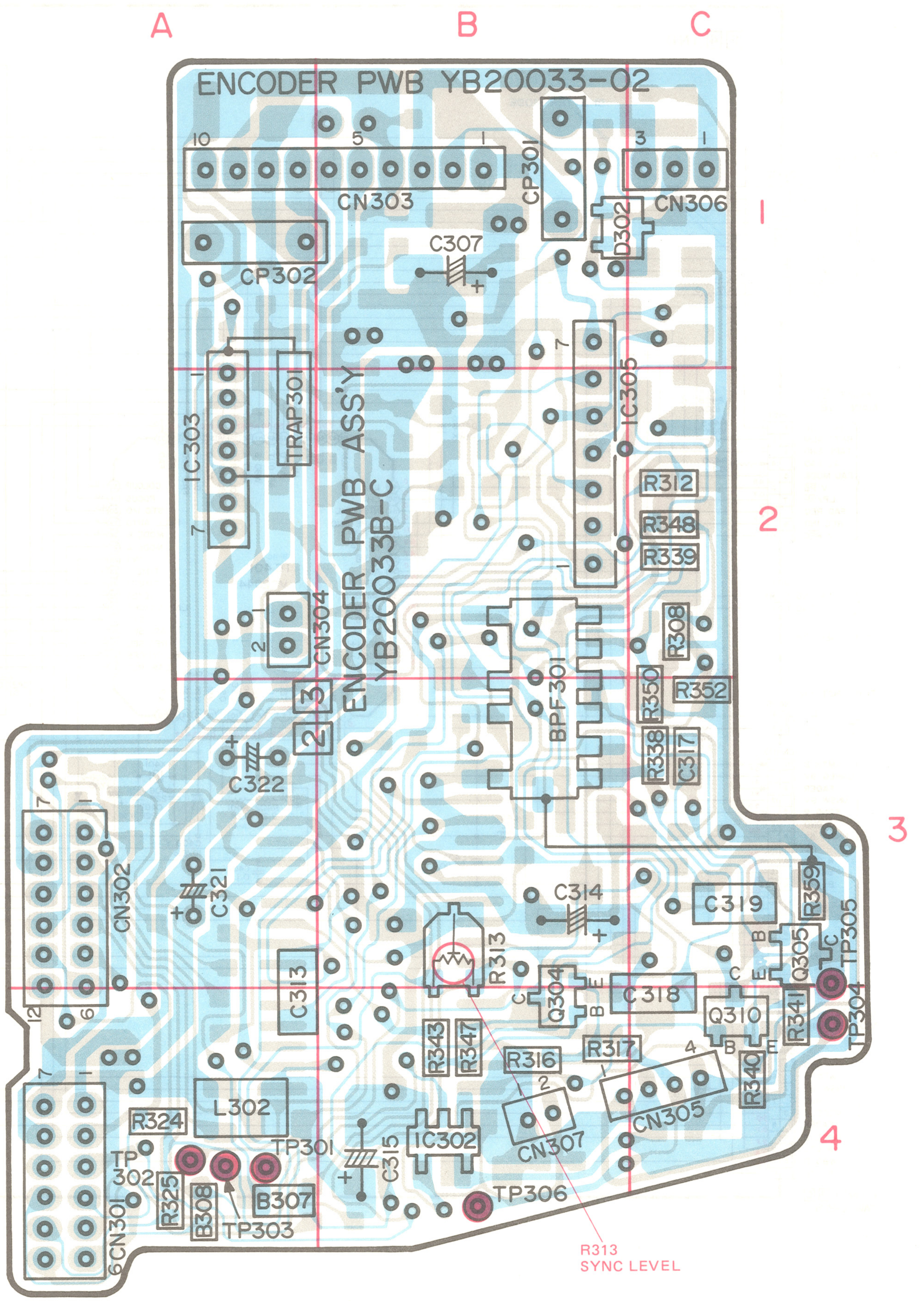
R307
BURST PHASE

R333
CHROMA GAIN

R327
B-Y CARRIER BAL

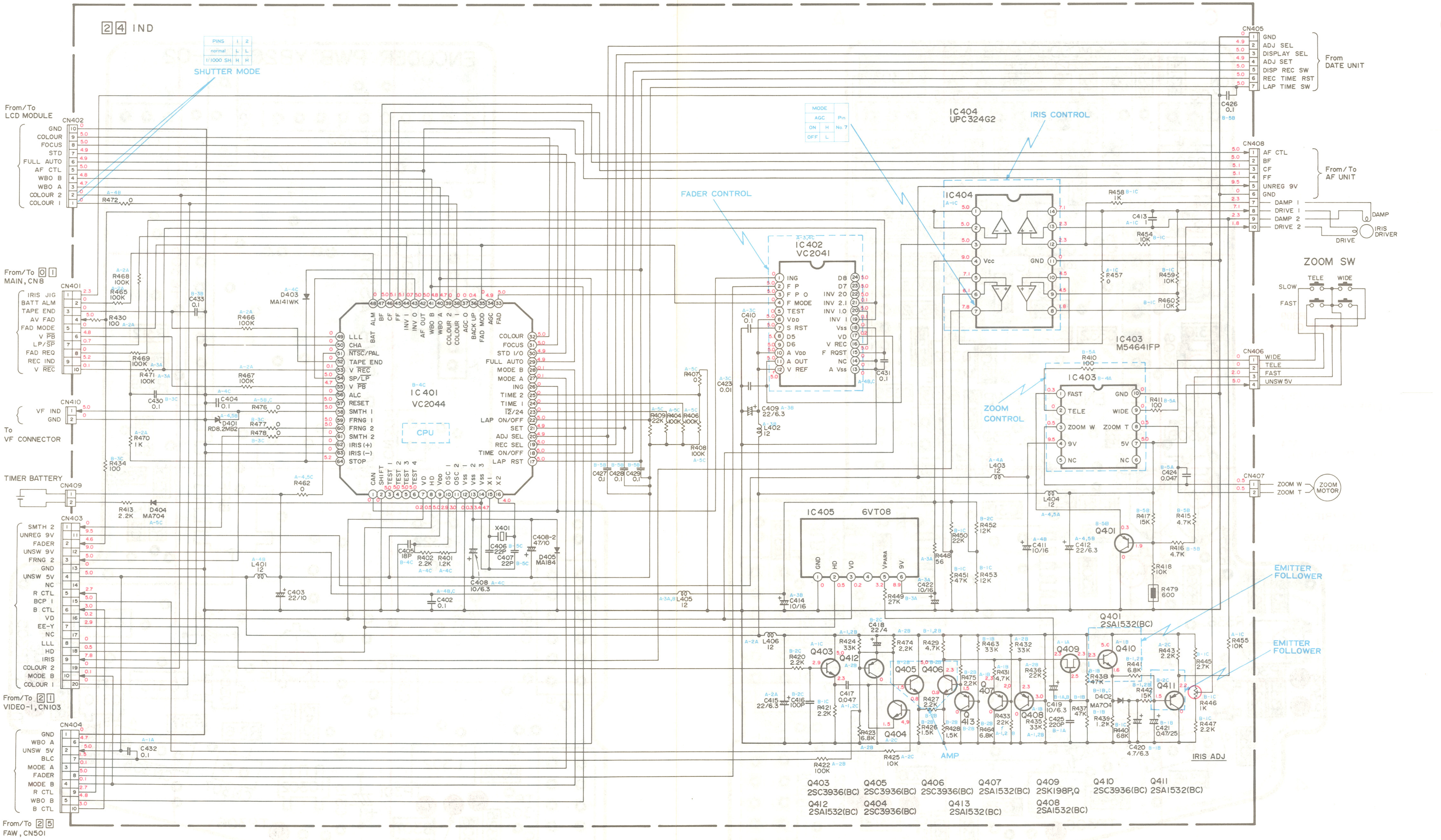
R330
CHROMA PHASE

— Front —


A
B
C
1
2
3
4
ENCODER PWB YB20033-02
ENCODER PWB ASS'Y
YB20033B-C
CN303
CP301
CN306
CP302
C307
D302
IC303
TRAP301
IC305
BPF301
CN304
CN302
CN301
C322
C321
C314
C319
Q304
Q305
Q310
C313
C318
L302
IC302
CN307
CN305
TP301
TP302
TP303
TP304
TP305
TP306

R313
SYNC LEVEL

4.29 INDICATOR SCHEMATIC DIAGRAM



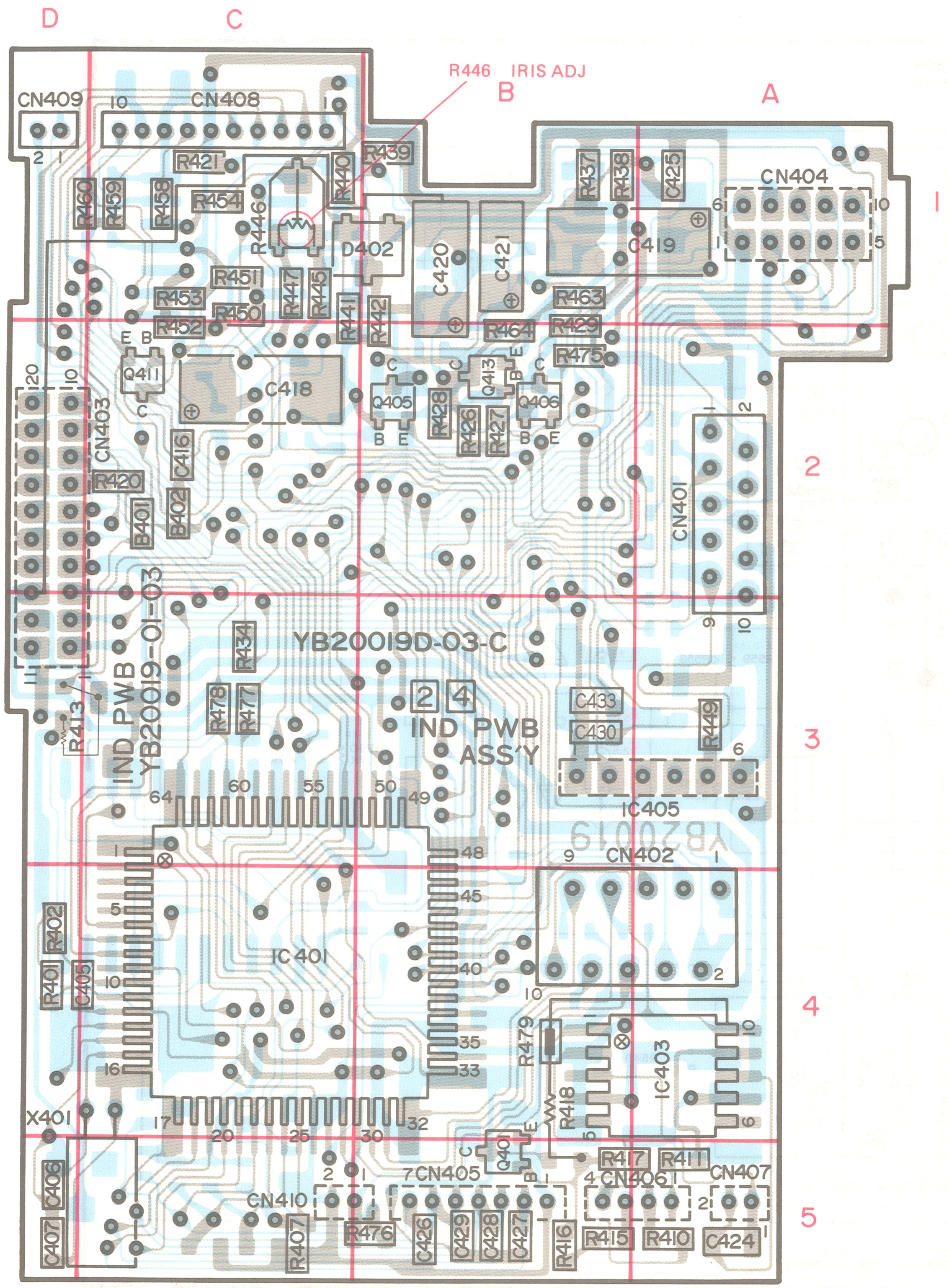
24 IND
SHUTTER MODE
PINS 1 2
normal L L
1/1000 SH H H
From/To LCD MODULE
CN402
GND
COLOUR
FOCUS
STD
FULL AUTO
AF CTL
WBO B
WBO A
COLOUR 2
COLOUR 1
From/To 01 MAIN, CN8
CN401
IRIS JIG
BATT ALM
TAPE END
AV FAD
FAD MODE
V PB
LP/SP
FAD REQ
REC IND
V REC
CN410
VF IND
GND
To VF CONNECTOR
TIMER BATTERY
CN409
CN403
SMTH 2
UNREG 9V
FADER
UNSW 9V
FRNG 2
GND
UNSW 5V
NC
R CTL
BCP 1
B CTL
VD
EE-Y
NC
LLL
HD
IRIS
COLOUR 2
MODE B
COLOUR 1
From/To 21 VIDEO-1, CN103
CN404
GND
WBO A
UNSW 5V
BLC
MODE A
FADER
MODE B
R CTL
WBO B
B CTL
From/To 25 FAW, CN501
IC401
VC2044
CPU
IC402
VC2041
FADER CONTROL
IC404
UPC324G2
IRIS CONTROL
MODE AGC Pin No. 7
ON H
OFF L
IC403
M5464IFP
ZOOM CONTROL
IC405 6VT08
CN405
GND
ADJ SEL
DISPLAY SEL
ADJ SET
DISP REC SW
REC TIME RST
LAP TIME SW
From DATE UNIT
CN408
AF CTL
BF
CF
FF
UNREG 9V
GND
DAMP 1
DRIVE 1
DAMP 2
DRIVE 2
From/To AF UNIT
DAMP
IRIS DRIVER
DRIVE
ZOOM SW
TELE
WIDE
SLOW
FAST
CN406
WIDE
TELE
FAST
UNSW 5V
CN407
ZOOM W
ZOOM T
ZOOM MOTOR
EMITTER FOLLOWER
EMITTER FOLLOWER
AMP
IRIS ADJ
Q401 2SA1532(BC)
Q403 2SC3936(BC)
Q405 2SC3936(BC)
Q406 2SC3936(BC)
Q407 2SA1532(BC)
Q409 2SK198P,Q
Q410 2SC3936(BC)
Q411 2SA1532(BC)
Q412 2SA1532(BC)
Q404 2SC3936(BC)
Q413 2SA1532(BC)
Q408 2SA1532(BC)
D401 RD8.2MB2
D403 MA141WK
D404 MA704
D405 MA184
D402 MA704
X401

NOTES: Unless otherwise specified.

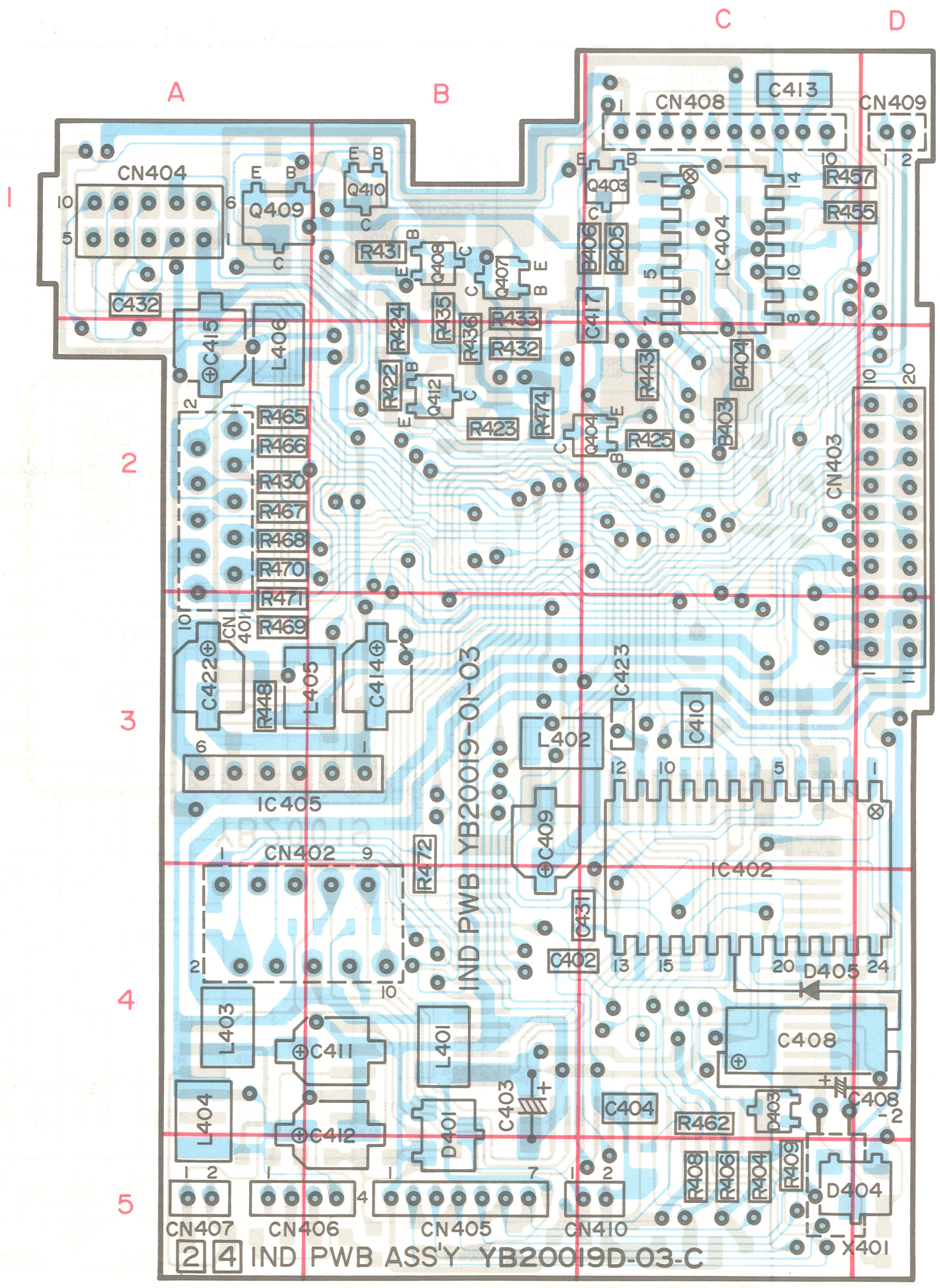
1. All resistance values are in ohms (1/6 W, 1/16 W).
2. All inductance values are in μH.
3. All capacitance values are in μF.

4.30 INDICATOR CIRCUIT BOARD

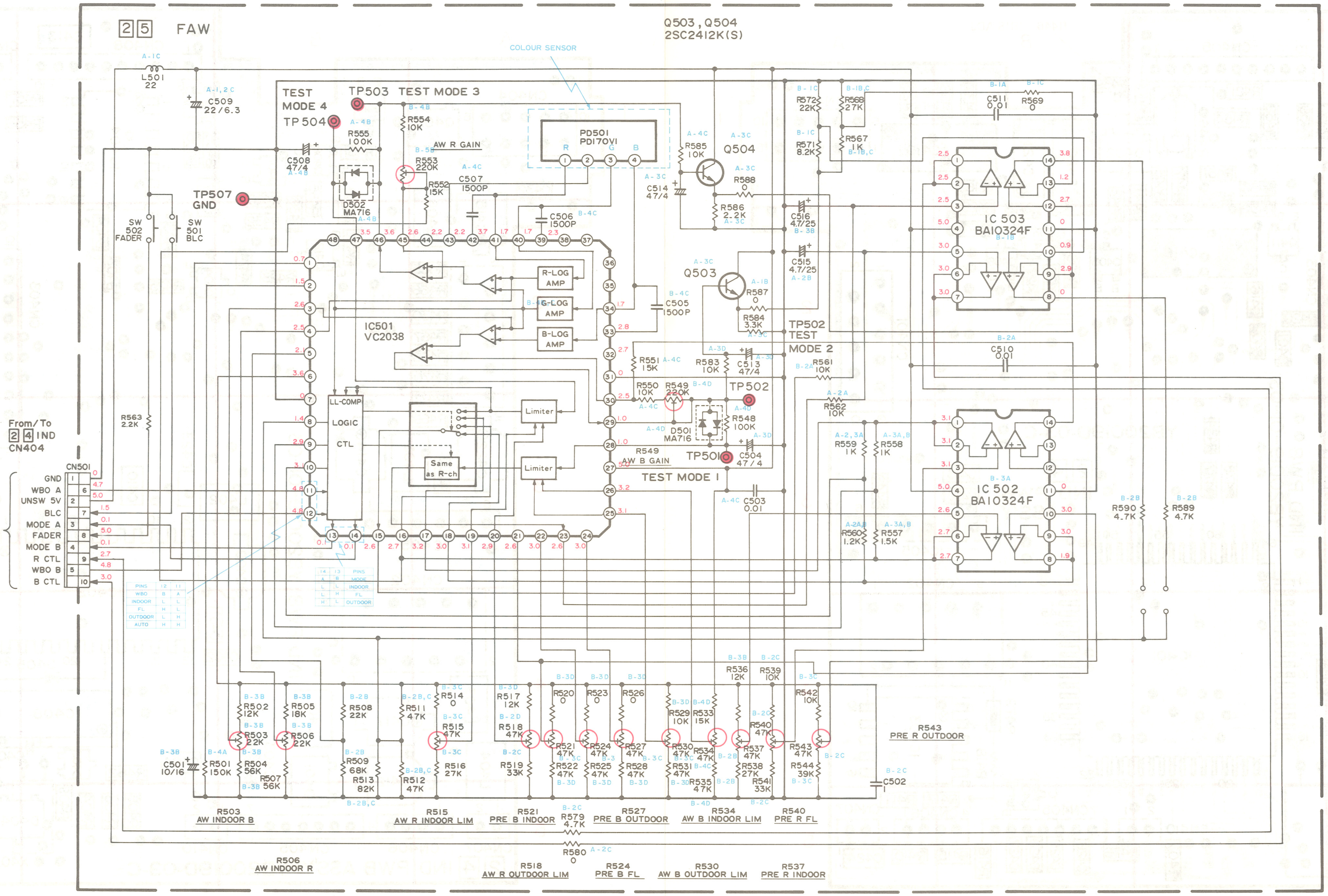
— Rear —


D
C
R446 IRIS ADJ
B
A
CN409
CN408
CN404
R421
R439
R440
R454
R446
R460
R459
R458
D402
C420
C421
R437
R438
C425
C419
R451
R447
R445
R453
R450
R452
R441
R442
R463
R464
R429
R475
Q411
C418
Q405
R428
R426
R427
Q413
Q406
CN403
C416
R420
B401
B402
CN401
YB20019-01-03
R434
YB20019D-03-C
2 4 IND PWB ASS'Y
IND PWB
R478
R477
R413
C433
C430
R449
IC405
CN402
IC401
R402
R401
C405
R479
R418
IC403
X401
Q401
R417
R411
CN405
CN406
CN407
CN410
C406
C407
R407
R476
C426
C429
C428
C427
R416
R415
R410
C424
1
2
3
4
5

— Front —

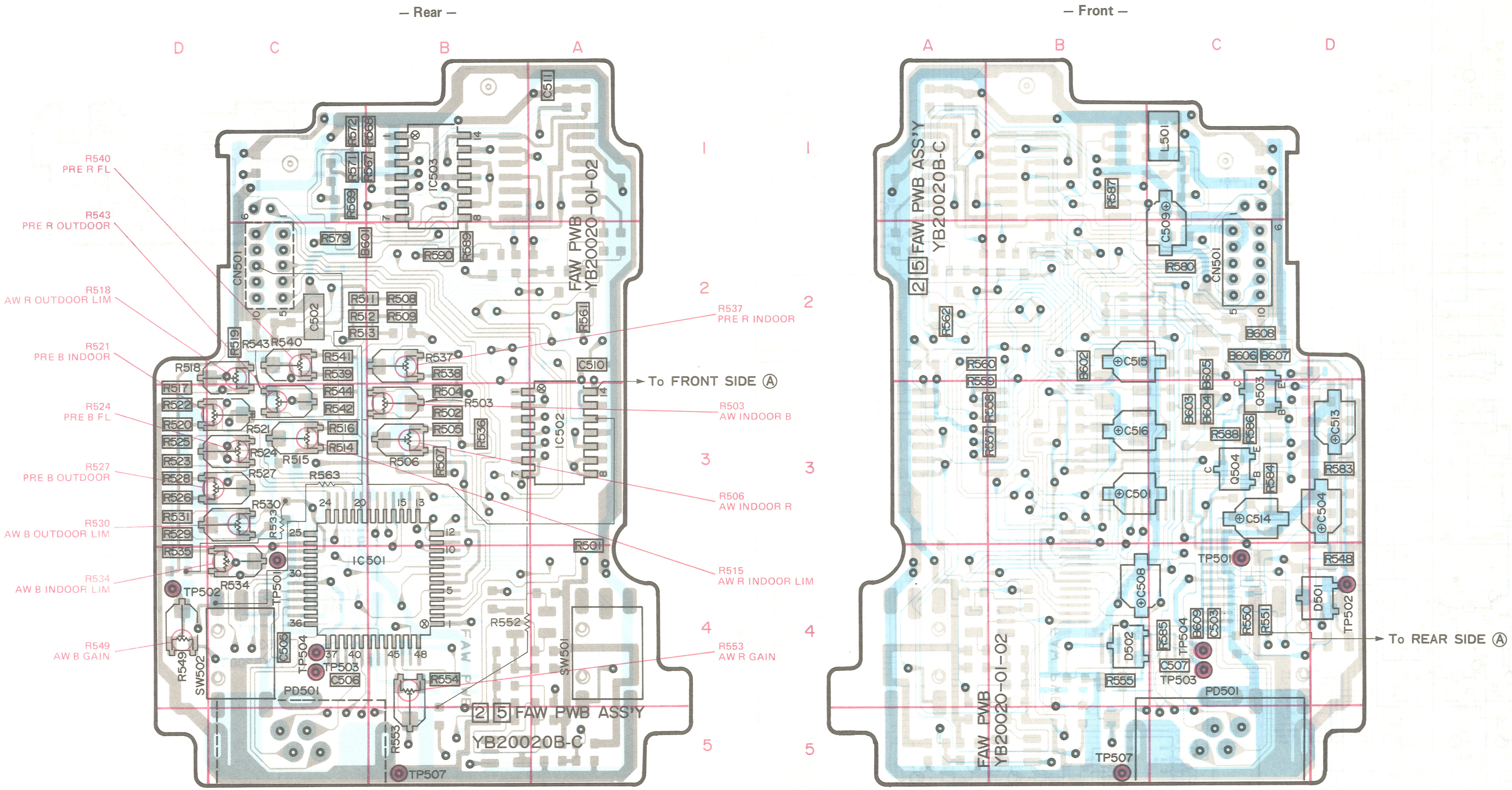

C
D
A
B
CN404
Q409
Q410
Q403
CN408
C413
CN409
R457
R455
IC404
R431
Q408
Q407
B406
B405
C432
C415
L406
R424
R435
R436
R433
R432
C417
R443
B404
R422
Q412
R465
R466
R430
R467
R468
R470
R471
R469
CN401
R423
R474
Q404
R425
B403
CN403
C422
R448
L405
C414
C423
C410
L402
IC405
YB20019-01-03
IND PWB
C409
R472
CN402
IC402
C431
C402
D405
L403
C411
L401
C408
L404
C412
D401
C403
C404
R462
D403
R408
R406
R404
R409
D404
CN407
CN406
CN405
CN410
X401
2 4 IND PWB ASS'Y YB20019D-03-C
1
2
3
4
5

4.31 FAW SCHEMATIC DIAGRAM



2 5 FAW
Q503, Q504
2SC2412K(S)
COLOUR SENSOR
L501 22
C509 22/6.3
TEST MODE 4
TP503 TEST MODE 3
TP504
R554 10K
R555 100K
AW R GAIN
C508 47/4
R553 220K
R552 15K
C507 1500P
D502 MA716
TP507 GND
SW 502 FADER
SW 501 BLC
PD501 PDI70VI
R G B
C506 1500P
R585 10K
Q504
C514 47/4
R588 0
R586 2.2K
R572 22K
R568 27K
R571 8.2K
R567 1K
C511 0.01
R569 0
C516 4.7/25
C515 4.7/25
IC 503 BA10324F
Q503
R587 0
R584 3.3K
C505 1500P
R-LOG AMP
G-LOG AMP
B-LOG AMP
IC501 VC2038
TP502 TEST MODE 2
C510 0.01
R551 15K
R583 10K
C513 47/4
R561 10K
R550 10K
R549 220K
TP502
R562 10K
LL-COMP
LOGIC
CTL
Limiter
Same as R-ch
Limiter
R548 100K
D501 MA716
R549 AW B GAIN
TP501
C504 47/4
TEST MODE 1
C503 0.01
R559 1K
R558 1K
IC 502 BA10324F
R590 4.7K
R589 4.7K
R560 1.2K
R557 1.5K
From/To 2 4 IND CN404
CN501
GND
WBO A
UNSW 5V
BLC
MODE A
FADER
MODE B
R CTL
WBO B
B CTL
R563 2.2K
C501 10/16
R501 150K
R502 12K
R503 2.2K
R504 56K
R505 18K
R506 22K
R507 56K
R508 22K
R509 68K
R513 82K
R511 47K
R512 47K
R514 0
R515 47K
R516 27K
R517 12K
R518 47K
R519 33K
R520 0
R521 47K
R522 47K
R523 0
R524 47K
R525 47K
R526 0
R527 47K
R528 47K
R529 10K
R533 15K
R530 47K
R531 47K
R534 47K
R535 47K
R536 12K
R539 10K
R540 47K
R537 47K
R538 27K
R541 33K
R542 10K
R543 47K
R544 39K
C502 1
R543 PRE R OUTDOOR
R503 AW INDOOR B
R515 AW R INDOOR LIM
R521 PRE B INDOOR
R579 4.7K
R527 PRE B OUTDOOR
R534 AW B INDOOR LIM
R540 PRE R FL
R580 0
R506 AW INDOOR R
R518 AW R OUTDOOR LIM
R524 PRE B FL
R530 AW B OUTDOOR LIM
R537 PRE R INDOOR
PINS 12 11
WBO B A
INDOOR L L
FL H L
OUTDOOR L H
AUTO H H
PINS 14 13
MODE
H L INDOOR
L H FL
H H OUTDOOR

4.32 FAW CIRCUIT BOARD



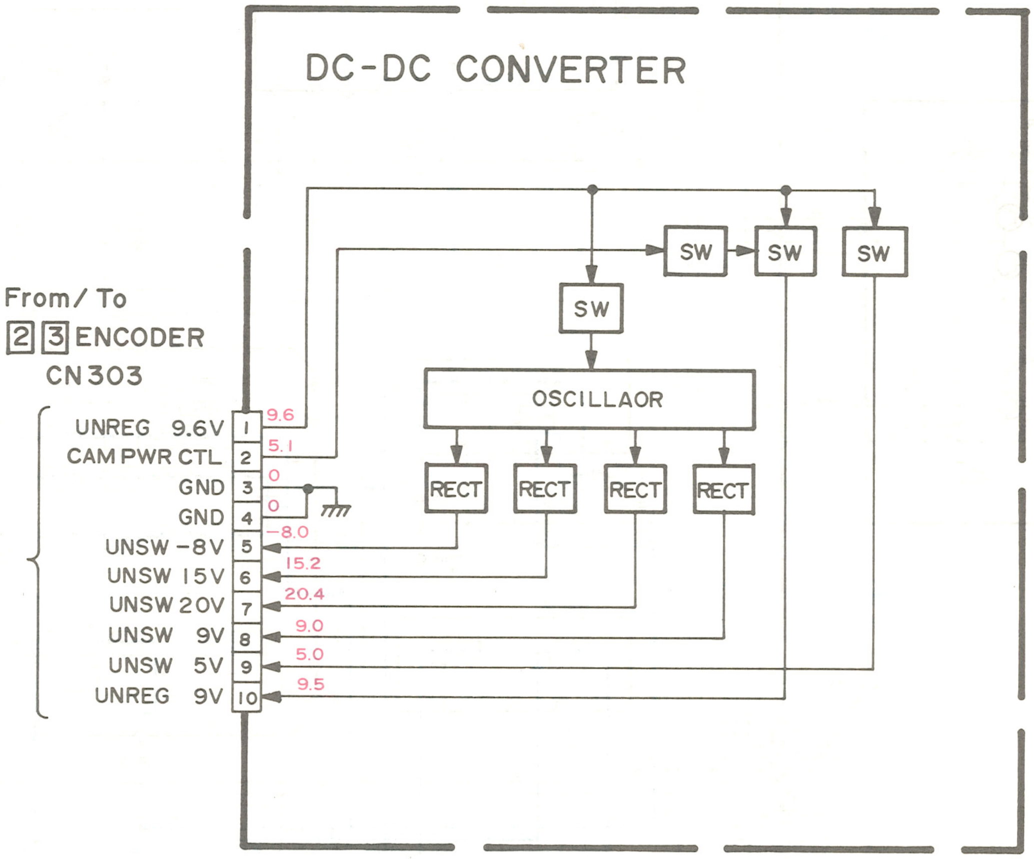
— Rear —

— Front —

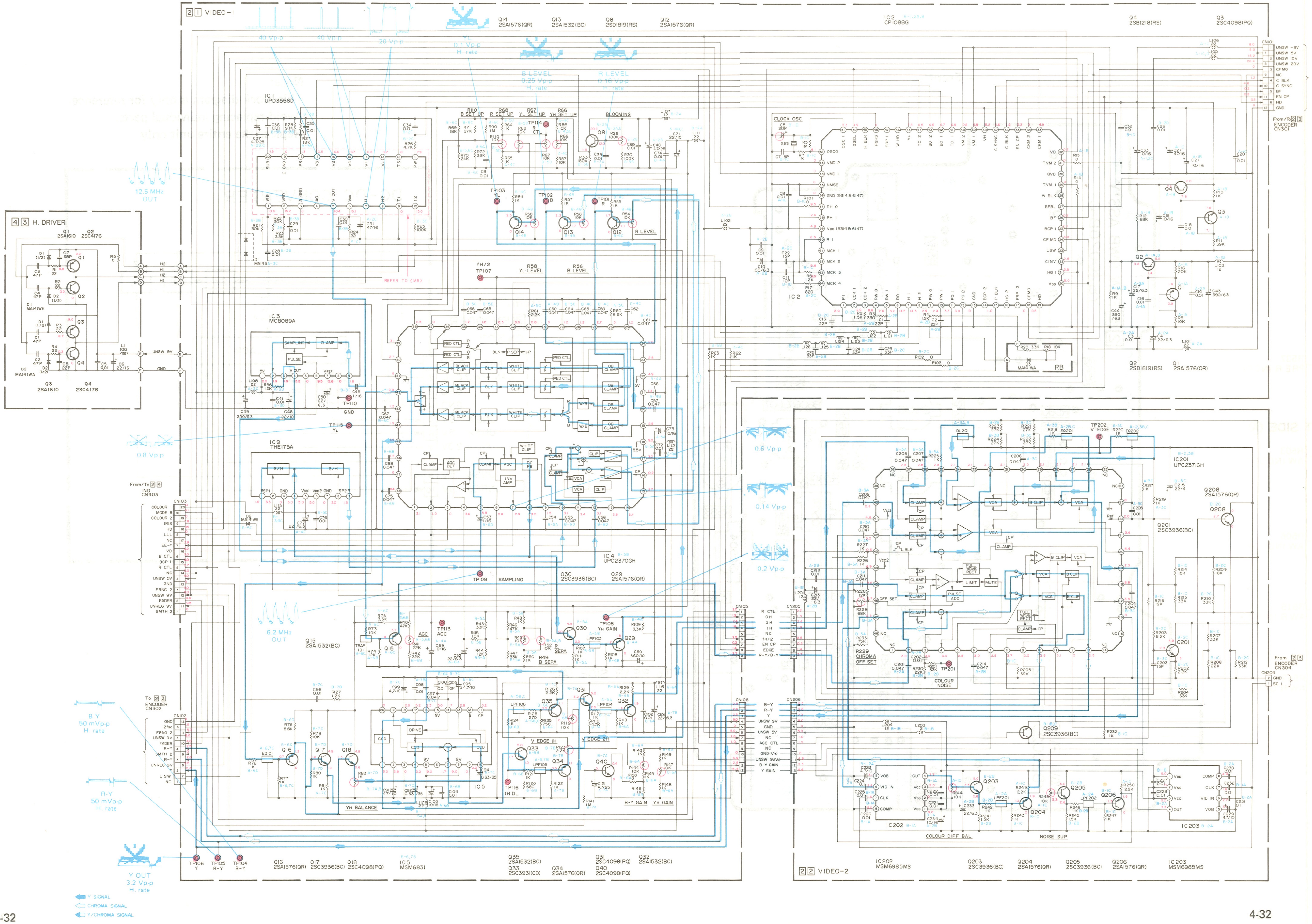
D
C
B
A
1
2
3
4
5
R540
PRE R FL
R543
PRE R OUTDOOR
R518
AW R OUTDOOR LIM
R521
PRE B INDOOR
R524
PRE B FL
R527
PRE B OUTDOOR
R530
AW B OUTDOOR LIM
R534
AW B INDOOR LIM
R549
AW B GAIN
R537
PRE R INDOOR
R503
AW INDOOR B
R506
AW INDOOR R
R515
AW R INDOOR LIM
R553
AW R GAIN
To FRONT SIDE Ⓐ
To REAR SIDE Ⓐ
IC501
IC502
IC503
CN501
SW501
SW502
PD501
TP501
TP502
TP503
TP504
TP507
2 5 FAW PWB ASS'Y
YB20020B-C
FAW PWB
YB20020-01-02
L501
D501
D502
Q503
Q504
C501
C502
C503
C504
C505
C506
C507
C508
C509
C510
C511
C513
C514
C515
C516

DC-DC CONVERTER BLOCK DIAGRAM

Note:
This block diagram is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

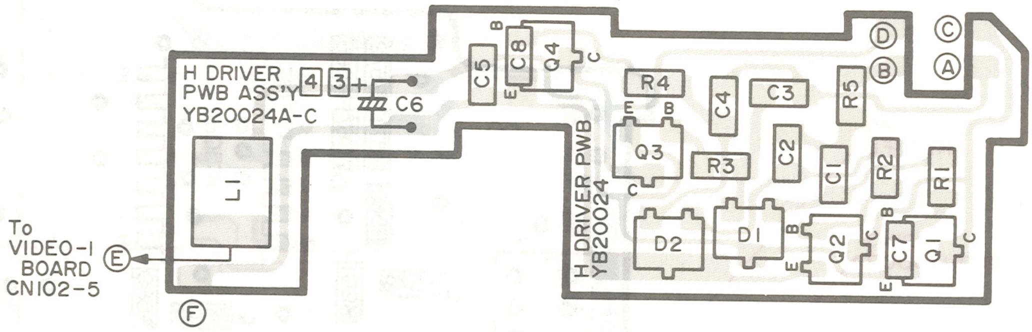

DC-DC CONVERTER
From/ To
2 3 ENCODER
CN303
UNREG 9.6V 1 9.6
CAM PWR CTL 2 5.1
GND 3 0
GND 4 0
UNSW −8V 5 −8.0
UNSW 15V 6 15.2
UNSW 20V 7 20.4
UNSW 9V 8 9.0
UNSW 5V 9 5.0
UNREG 9V 10 9.5
SW
SW
SW
SW
OSCILLAOR
RECT
RECT
RECT
RECT

4.34 VIDEO SCHEMATIC DIAGRAM

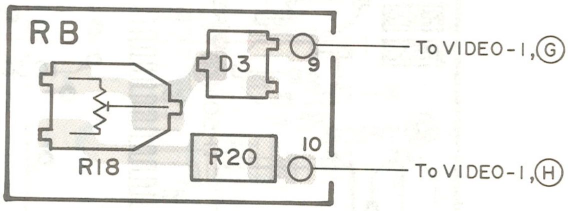

2 1 VIDEO-1
4 3 H. DRIVER
2 2 VIDEO-2
IC1 UPD3556D
IC2 CP1088G
IC3 MC8089A
IC4 UPC2370GH
IC5 MSM6831
IC9 THE175A
IC201 UPC2371GH
IC202 MSM6985MS
IC203 MSM6985MS
CLOCK OSC
BLOOMING
B SET UP
R SET UP
YL SET UP
YH SET UP
YL LEVEL
B LEVEL
R LEVEL
SAMPLING
AGC
B SEPA
YH GAIN
YH BALANCE
V EDGE 1H
V EDGE 2H
B-Y GAIN
YH GAIN
COLOUR NOISE
CHROMA OFF SET
COLOUR DIFF BAL
NOISE SUP
12.5 MHz OUT
6.2 MHz OUT
40 Vp-p
20 Vp-p
YL 0.1 Vp-p H. rate
B LEVEL 0.25 Vp-p H. rate
R LEVEL 0.15 Vp-p H. rate
0.8 Vp-p
0.6 Vp-p
0.14 Vp-p
0.2 Vp-p
B-Y 50 mVp-p H. rate
R-Y 50 mVp-p H. rate
Y OUT 3.2 Vp-p H. rate
From/To 2 4 IND CN403
To 2 3 ENCODER CN302
From/To 2 3 ENCODER CN301
From 2 3 ENCODER CN304
TP106 Y
TP105 R-Y
TP104 B-Y
REFER TO (MS)

Y SIGNAL
CHROMA SIGNAL
Y/CHROMA SIGNAL

– H. DRIVER –


H DRIVER
PWB ASS'Y
YB20024A-C
4
3
C6
C5
C8
Q4
B
E
C
R4
C4
C3
R5
Ⓓ
Ⓑ
Ⓒ
Ⓐ
E B
Q3
C
R3
C2
C1
R2
R1
H DRIVER PWB
YB20024
L1
D2
D1
Q2
C7
Q1
To
VIDEO-1
BOARD
CN102-5
Ⓔ
Ⓕ

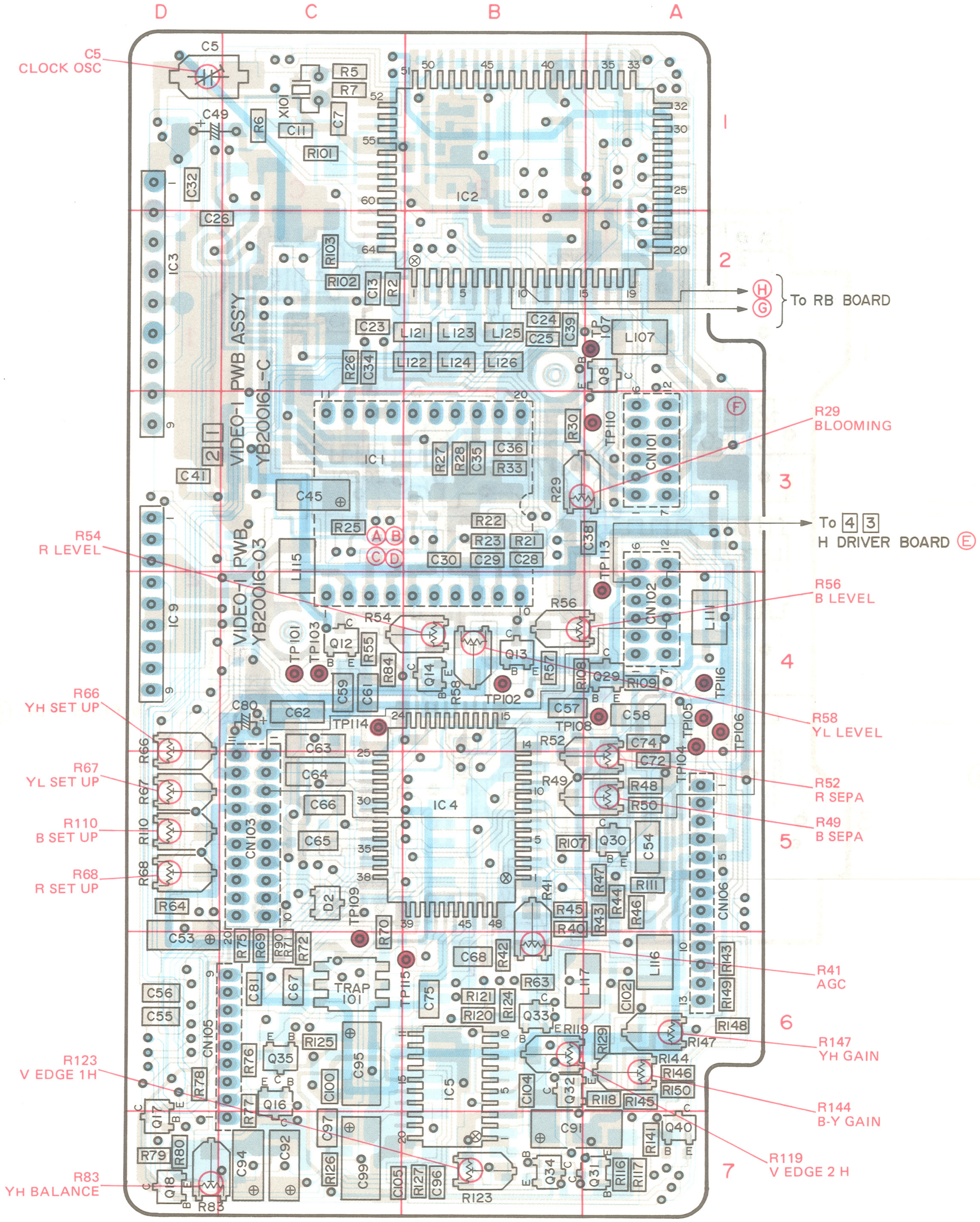
– RB –


RB
D3
9
To VIDEO-1, Ⓖ
R18
R20
10
To VIDEO-1, Ⓗ

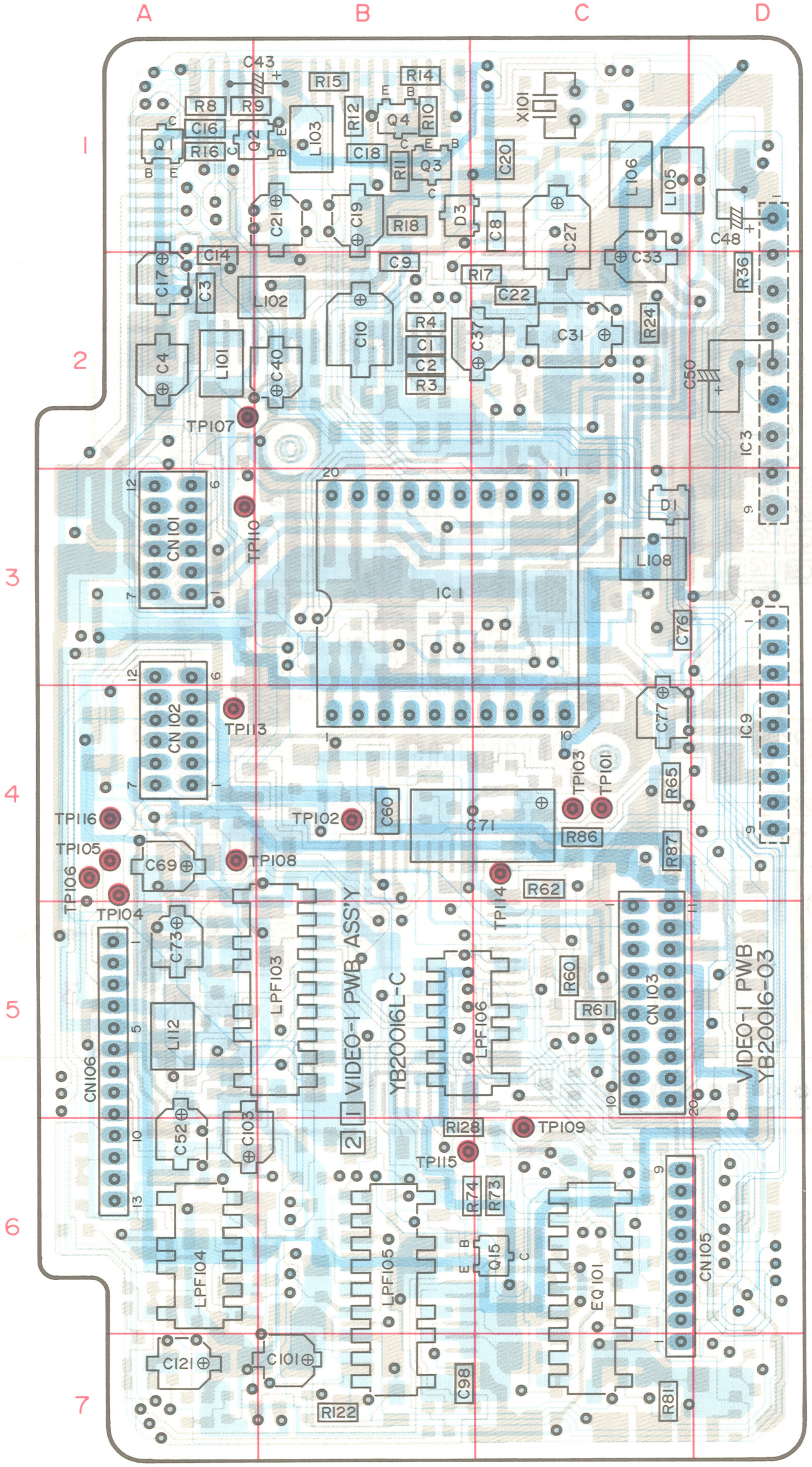
RB PWB YB20053
RB PWB ASS'Y YB20053A-C

4.35 VIDEO-1 CIRCUIT BOARD

— Rear —

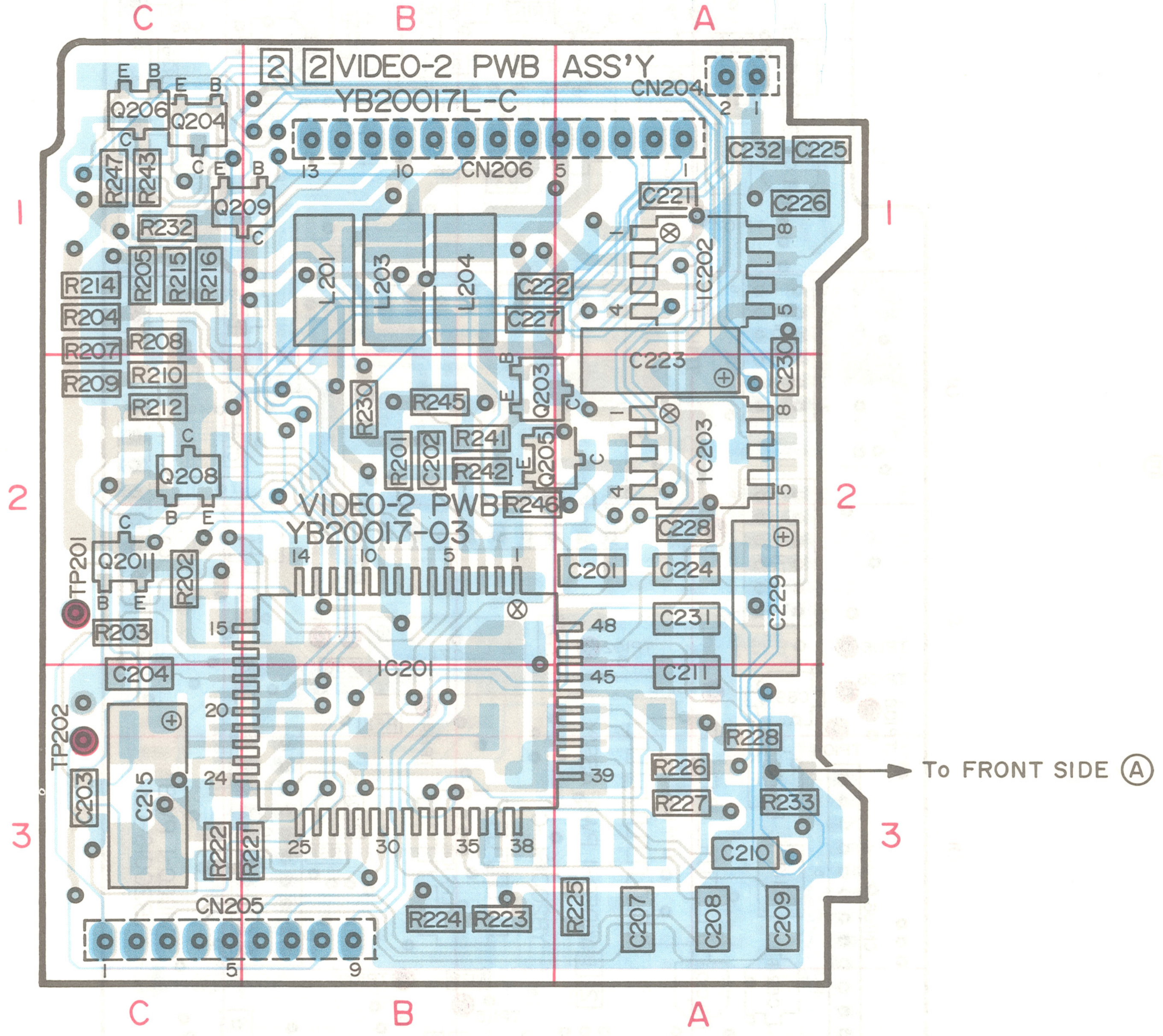

D
C
B
A
C5
CLOCK OSC
R54
R LEVEL
R66
YH SET UP
R67
YL SET UP
R110
B SET UP
R68
R SET UP
R123
V EDGE 1H
R83
YH BALANCE
Ⓗ
Ⓖ
To RB BOARD
Ⓕ
R29
BLOOMING
To 4 3
H DRIVER BOARD Ⓔ
R56
B LEVEL
R58
YL LEVEL
R52
R SEPA
R49
B SEPA
R41
AGC
R147
YH GAIN
R144
B-Y GAIN
R119
V EDGE 2 H
1
2
3
4
5
6
7
VIDEO-1 PWB ASS'Y
YB20016L-C
VIDEO-1 PWB
YB20016-03
IC1
IC2
IC3
IC4
IC5
IC9
CN101
CN102
CN103
CN105
CN106
TRAP 101
TP101
TP102
TP103
TP104
TP105
TP106
TP107
TP108
TP109
TP110
TP113
TP114
TP115
TP116

— Front —


A
B
C
D
1
2
3
4
5
6
7
VIDEO-1 PWB ASS'Y
YB20016L-C
VIDEO-1 PWB
YB20016-03
IC1
IC3
IC9
CN101
CN102
CN103
CN105
CN106
LPF103
LPF104
LPF105
LPF106
EQ101
TP101
TP102
TP103
TP104
TP105
TP106
TP107
TP108
TP109
TP110
TP113
TP114
TP115
TP116

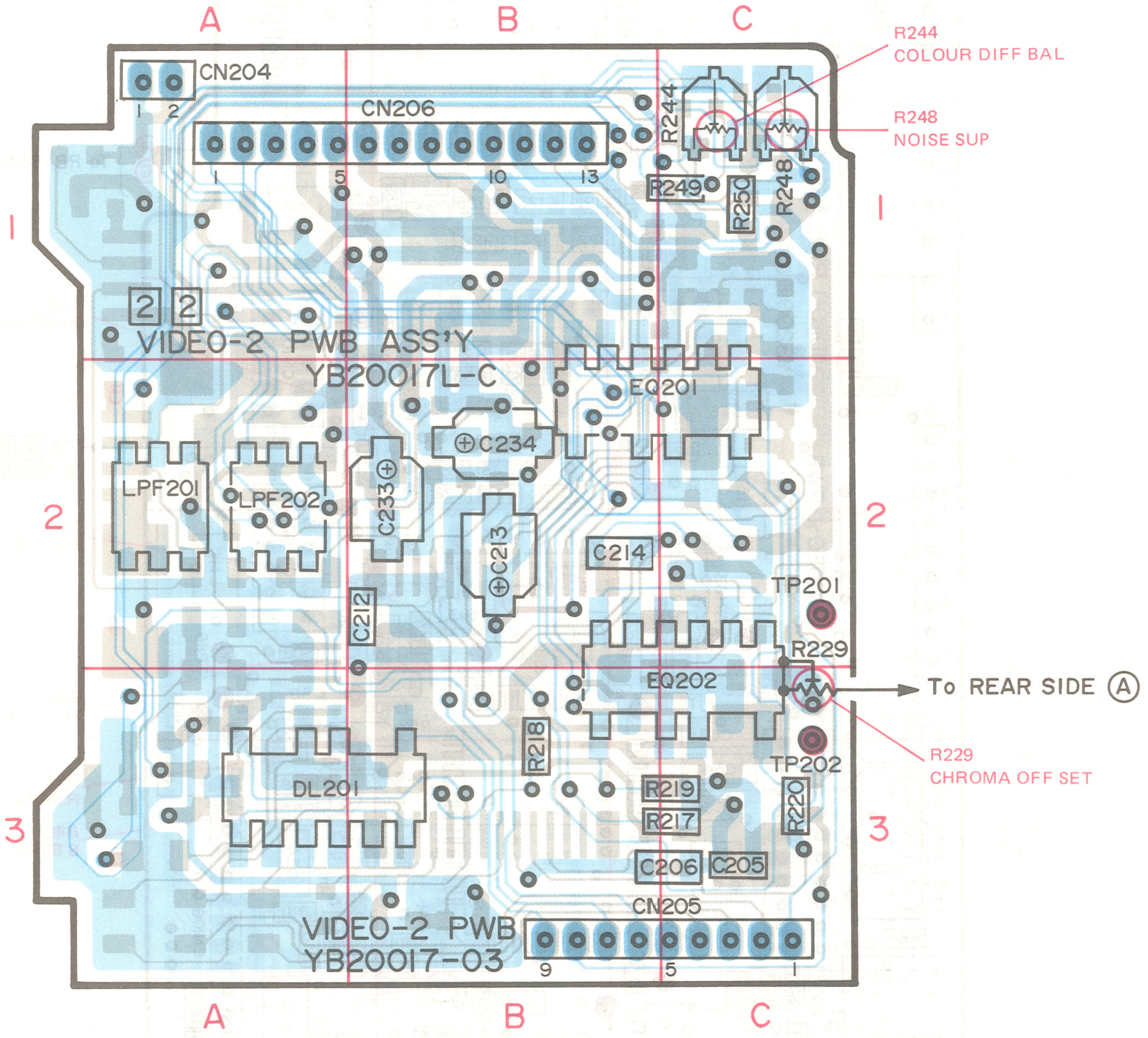
4.36 VIDEO-2 CIRCUIT BOARD

— Rear —



C
B
A
1
2
3
2 2 VIDEO-2 PWB ASS'Y
YB20017L-C
CN204
CN206
Q206
Q204
Q209
Q208
Q201
Q203
Q205
R247
R243
R232
R214
R205
R215
R216
R204
R207
R208
R209
R210
R212
R230
R245
R241
R242
R246
R201
C202
R202
R203
TP201
TP202
C204
C203
C215
R222
R221
L201
L203
L204
C221
C222
C227
C223
C226
C232
C225
C230
IC202
IC203
VIDEO-2 PWB
YB20017-03
IC201
C201
C228
C224
C231
C211
C229
R228
R226
R227
R233
C210
R224
R223
R225
C207
C208
C209
CN205
To FRONT SIDE Ⓐ

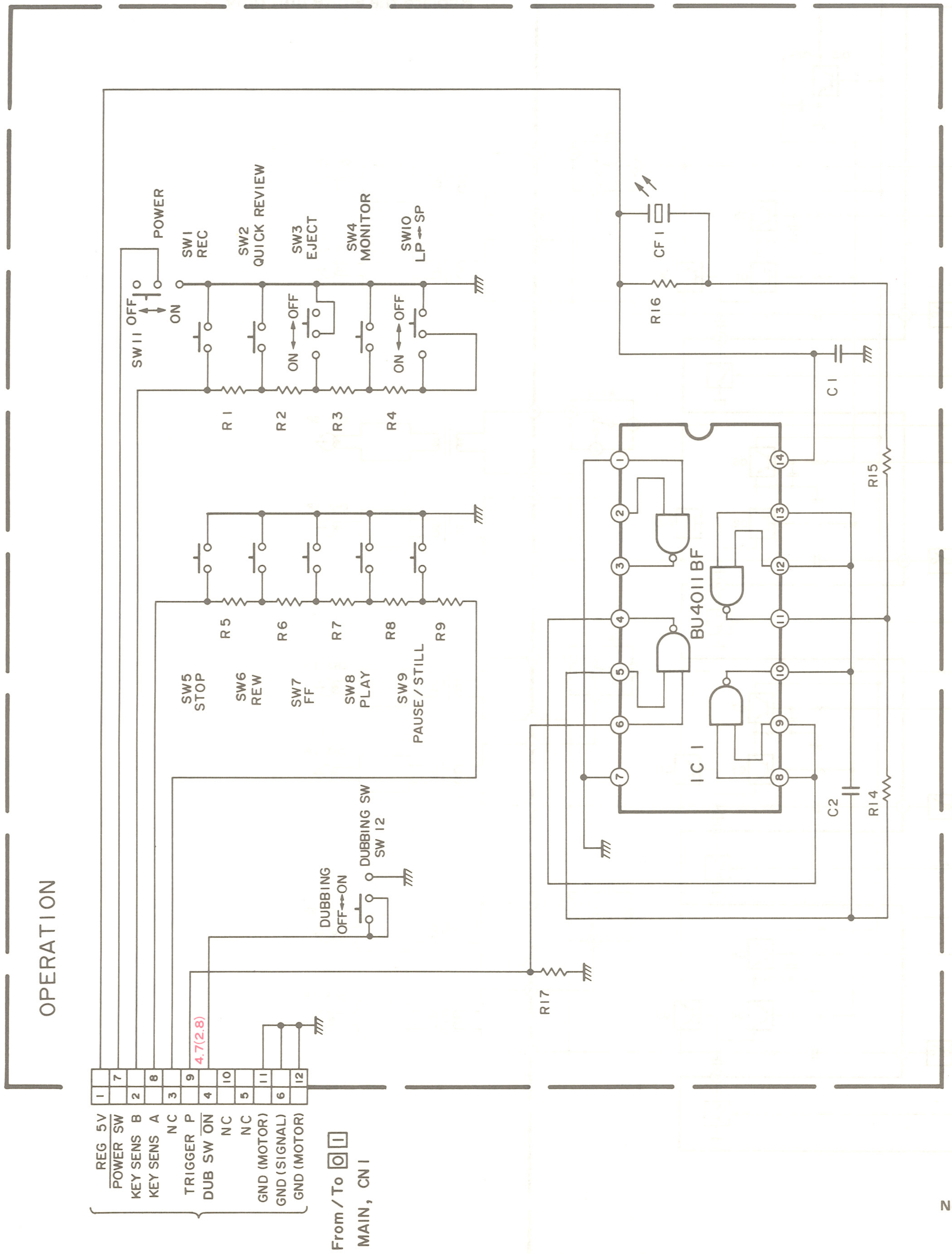
— Front —



A
B
C
1
2
3
CN204
CN206
R244
R244 COLOUR DIFF BAL
R248 NOISE SUP
R249
R250
R248
2 2 VIDEO-2 PWB ASS'Y
YB20017L-C
EQ201
C234
LPF201
LPF202
C233
C213
C214
TP201
C212
R229
EQ202
To REAR SIDE Ⓐ
R229 CHROMA OFF SET
TP202
DL201
R218
R219
R217
R220
C206
C205
CN205
VIDEO-2 PWB
YB20017-03

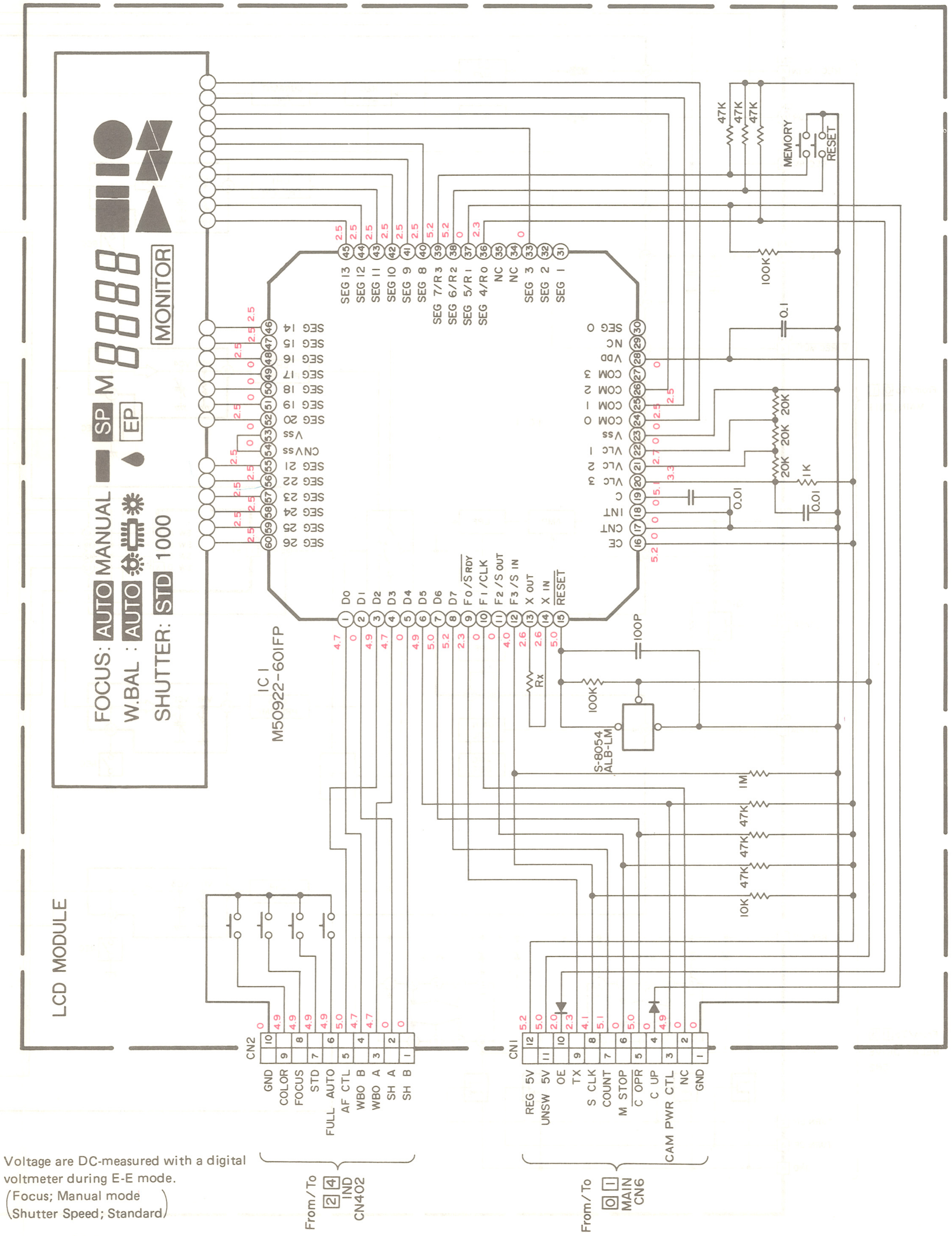
4.37 OPERATION SCHEMATIC DIAGRAM

Note:
This schematic diagram is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.


OPERATION
SW11 POWER
OFF ON
SW1 REC
SW2 QUICK REVIEW
SW3 EJECT
SW4 MONITOR
SW10 LP↔SP
ON↔OFF
R1
R2
R3
R4
R5
R6
R7
R8
R9
SW5 STOP
SW6 REW
SW7 FF
SW8 PLAY
SW9 PAUSE / STILL
CF1
R16
C1
R15
R14
C2
IC1 BU4011BF
DUBBING SW SW12
DUBBING OFF↔ON
R17
4.7(2.8)
REG 5V
POWER SW
KEY SENS B
KEY SENS A
NC
TRIGGER P
DUB SW ON
NC
NC
GND (MOTOR)
GND (SIGNAL)
GND (MOTOR)
From / To 0 1 MAIN, CN1

4.38 LCD MODULE SCHEMATIC DIAGRAM

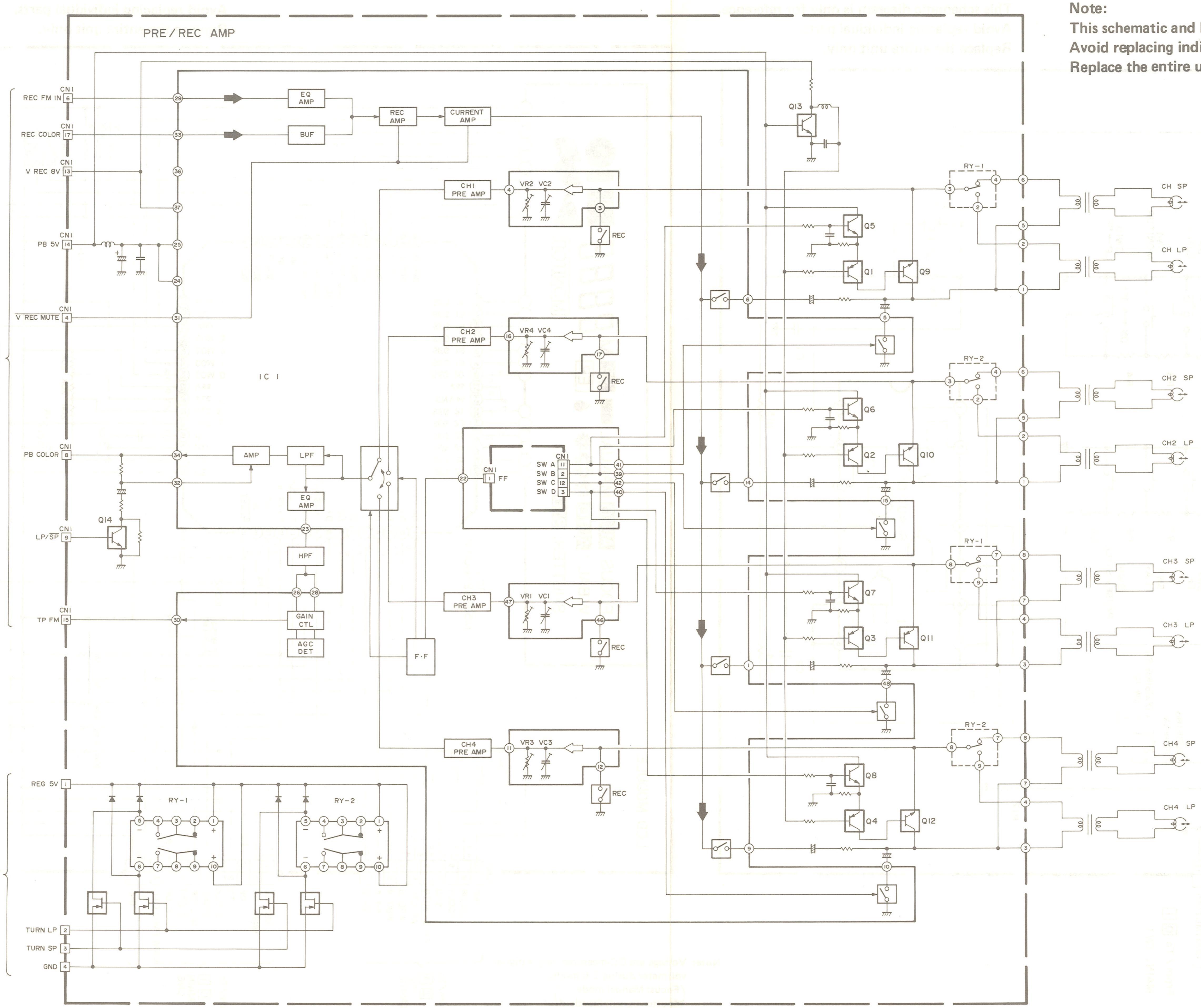
Note:
This schematic diagram is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.


LCD MODULE
FOCUS: AUTO MANUAL
W.BAL: AUTO
SHUTTER: STD 1000
SP
EP
M
8888
MONITOR
IC1 M50922-601FP
SEG 13
SEG 12
SEG 11
SEG 10
SEG 9
SEG 8
SEG 7/R3
SEG 6/R2
SEG 5/R1
SEG 4/R0
NC
NC
SEG 3
SEG 2
SEG 1
SEG 0
VDD
COM 3
COM 2
COM 1
COM 0
VSS
VLC 1
VLC 2
VLC 3
C
INT
CNT
CE
D0
D1
D2
D3
D4
D5
D6
D7
F0/S RDY
F1/CLK
F2/S OUT
F3/S IN
X OUT
X IN
RESET
SEG 14
SEG 15
SEG 16
SEG 17
SEG 18
SEG 19
SEG 20
VSS
CNVSS
SEG 21
SEG 22
SEG 23
SEG 24
SEG 25
SEG 26
47K
47K
47K
MEMORY
RESET
100K
0.1
20K
20K
20K
1K
0.01
0.01
100P
Rx
100K
S-8054 ALB-LM
1M
47K
47K
47K
10K
CN2
GND
COLOR
FOCUS
STD
FULL AUTO
AF CTL
WBO B
WBO A
SH A
SH B
From / To 2 4 IND CN402
CN1
REG 5V
UNSW 5V
OE
TX
S CLK
COUNT
M STOP
C OPR
C UP
CAM PWR CTL
NC
GND
From / To 0 1 MAIN CN6

Note: Voltage are DC-measured with a digital voltmeter during E-E mode.
(Focus; Manual mode
Shutter Speed; Standard)

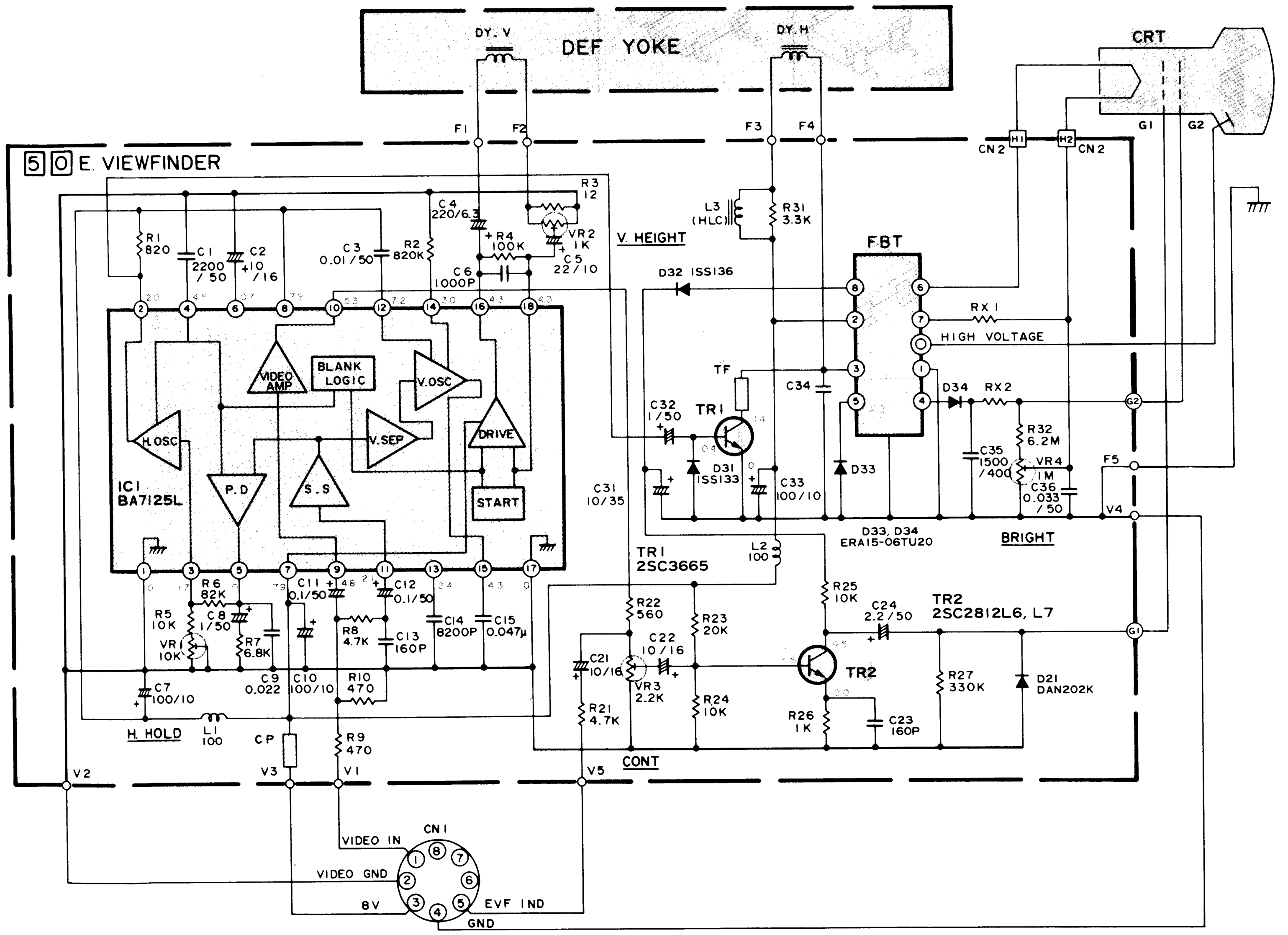
4.39 PRE/REC AMP SCHEMATIC AND BLOCK DIAGRAM

Note:
This schematic and block diagram is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.



PRE / REC AMP
CN1 REC FM IN 6
CN1 REC COLOR 17
CN1 V REC 8V 13
CN1 PB 5V 14
CN1 V REC MUTE 4
From/To 01 MAIN,CN11
CN1 PB COLOR 8
CN1 LP/SP 9
CN1 TP FM 15
Q14
IC 1
EQ AMP
BUF
REC AMP
CURRENT AMP
CH1 PRE AMP
VR2 VC2
REC
CH2 PRE AMP
VR4 VC4
AMP
LPF
EQ AMP
HPF
GAIN CTL
AGC DET
F·F
CN1 FF
CN1
SW A 11
SW B 2
SW C 12
SW D 3
CH3 PRE AMP
VR1 VC1
CH4 PRE AMP
VR3 VC3
Q13
Q5
Q1
Q9
Q6
Q2
Q10
Q7
Q3
Q11
Q8
Q4
Q12
RY-1
RY-2
CH SP
CH LP
CH2 SP
CH2 LP
CH3 SP
CH3 LP
CH4 SP
CH4 LP
REG 5V 1
RY-1
RY-2
From/To 15 RELAY DRIVE CN2
TURN LP 2
TURN SP 3
GND 4

4.40 ELECTRONIC VIEWFINDER SCHEMATIC DIAGRAM

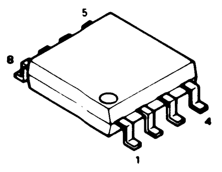
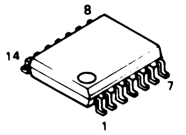
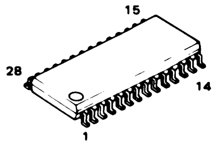
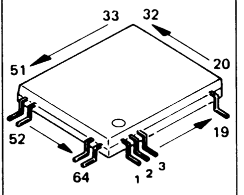
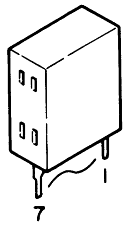
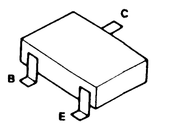
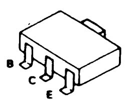
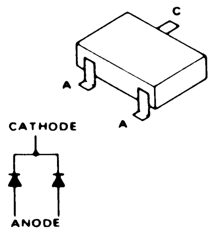
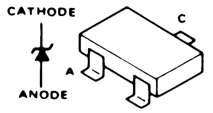
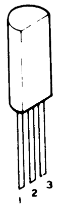
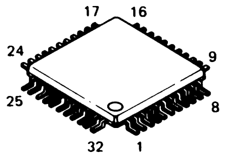
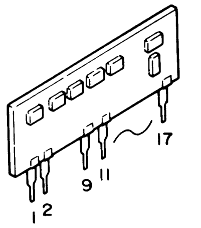
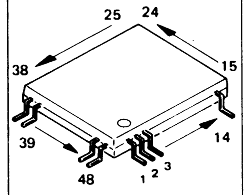
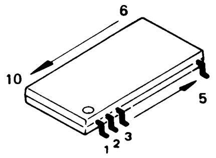
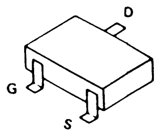
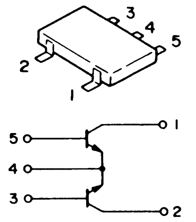
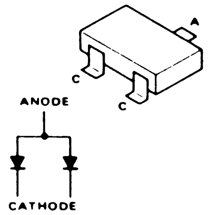
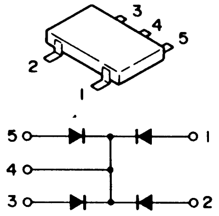
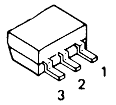
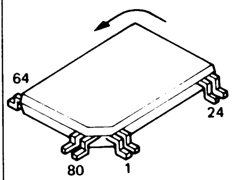
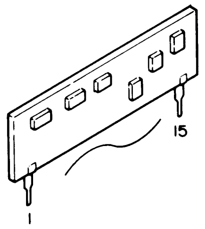
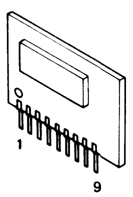
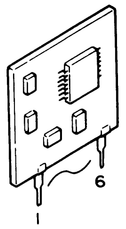
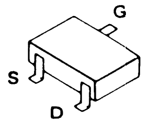
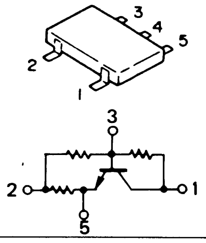
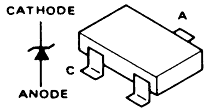
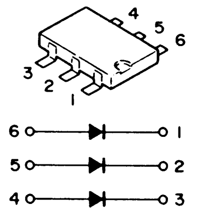
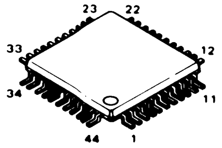
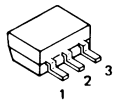
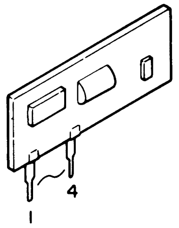
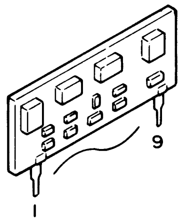
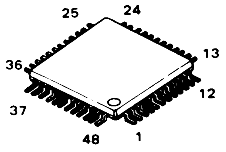
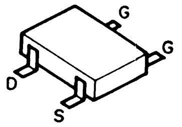
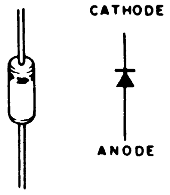
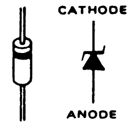
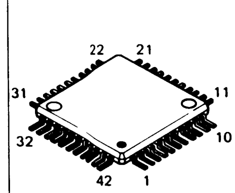
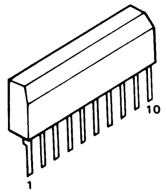
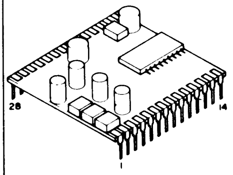
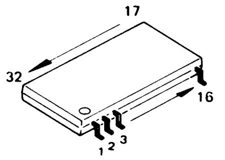
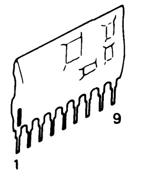
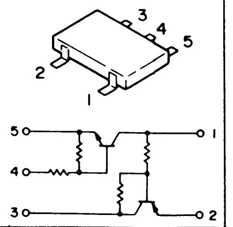
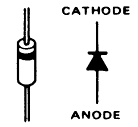
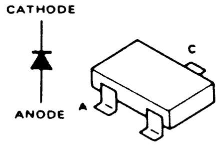
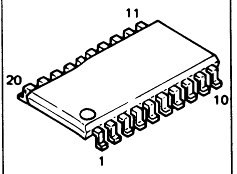
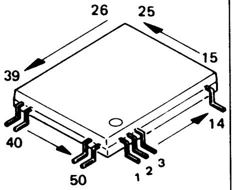
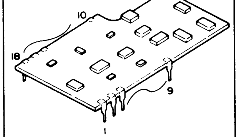
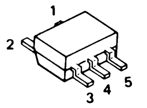
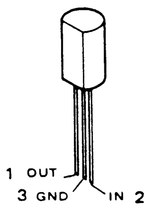
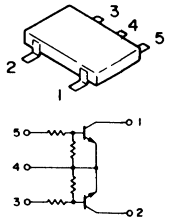
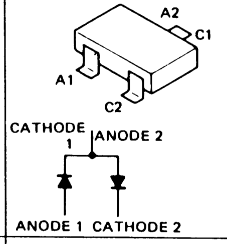
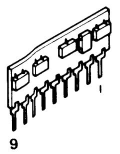
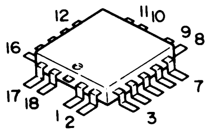
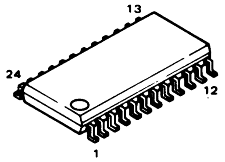
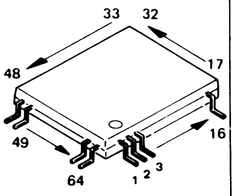
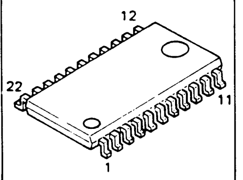
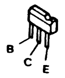
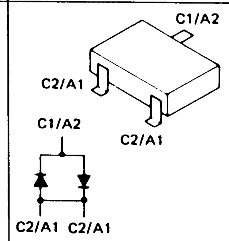
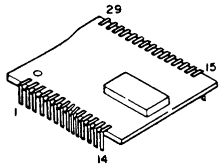
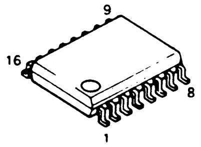
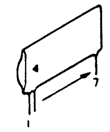

DEF YOKE
DY. V
DY. H
F1
F2
F3
F4
F5
CRT
G1
G2
CN2
H1
H2
5 0 E. VIEWFINDER
IC1
BA7125L
VIDEO AMP
BLANK LOGIC
V.OSC
H.OSC
V.SEP
DRIVE
P.D
S.S
START
R1 820
C1 2200/50
C2 10/16
C3 0.01/50
R2 820K
C4 220/6.3
R4 100K
R3 12
VR2 1K
C5 22/10
C6 1000P
V. HEIGHT
L3 (HLC)
R31 3.3K
FBT
D32 1SS136
RX1
HIGH VOLTAGE
TF
C34
C32 1/50
TR1
D31 1SS133
C33 100/10
D33
D34
RX2
C35 1500/400
R32 6.2M
VR4 1M
C36 0.033/50
V4
C31 10/35
D33, D34 ERA15-06TU20
BRIGHT
TR1 2SC3665
L2 100
R6 82K
R5 10K
C8 1/50
VR1 10K
R7 6.8K
C11 0.1/50
C12 0.1/50
R8 4.7K
C13 160P
C14 8200P
C15 0.047μ
C7 100/10
C9 0.022
C10 100/10
R10 470
H. HOLD
L1 100
CP
R9 470
V2
V3
V1
V5
R22 560
R23 20K
C22 10/16
C21 10/16
VR3 2.2K
R21 4.7K
R24 10K
CONT
R25 10K
C24 2.2/50
TR2 2SC2812L6, L7
TR2
R27 330K
D21 DAN202K
R26 1K
C23 160P
CN1
VIDEO IN
VIDEO GND
8V
EVF IND
GND

4.41 SEMICONDUCTOR SHAPES

NAME		L
IC		
A	AFZ74A001X1 AFZ74A002X1 AN2275S AN3212S AN3323S AN3592S AN6308S AN8009	7A 7A 5D 1C 1C 7E 1A 6E
B	BA10324F BA226F BA6452F BA6993F BA7131F BA7258AK BA7600K BA7757K BU3721K BU4011F BU4584BF	1B 1A 7C 1A 1A 4A 4A 2B 4A 1B 1B
C	CP1088G	1D
H	HD6305Z0F-CV05 H8D1927A H8D7046 H8D7047 H8D7048 H8D7051A	3B 5E 4C 3C 2C 8A
I	IR3702N1	1B
M	MC8089A MC8180B MC8181D MN3106S MSM6830 MSM6831 MSM6846MS MSM6984MS MSM6985MS MSM6989MS M51648FP M51799FP M5236ML M52410FP M5282FP M54543ASL-A M54641FP	3D 1E 1E 1A 6A 6A 1A 1A 1A 1A 6B 5A 3A 6A 1A 5B 2E
N	NJM2904E	1A
S	S-81250AG S8054HN	2A 4B
T	TA7374P TC4S69F TC4S71F THE175A THE191A THE245 TME234	8C 6D 6D 4D 5C 8A 6C

NAME		L
U	UPC2370GH UPC2371GH UPC324G2 UPD4538BG	2D 2D 1B 8B
V	VC2031MP VC2038 VC2039 VC2041 VC2043 VC2044 VC5026G	7B 4E 7D 7C 7D 7D 6A
	6VT07 6VT08	3E 3E
TRANSISTOR		
D	DTA124EU DTC124EU DTC144ES DTC144EU DTC144WK DTC144WU	1F 1F 7F 1F 1F 1F
F	FMC2 FMG1 FMG2 FMU1 FMW1 FMW3	5F 6F 6F 3G 2G 2G
2SA	2SA1036K 2SA1532 2SA1576 2SA1610 2SA1611 2SA881R	1F 1F 1F 1F 1F 7F
2SB	2SB1009 2SB1218 2SB624 2SB798	7F 1F 1F 1G
2SC	2SC2412K 2SC3931 2SC3936 2SC4081 2SC4098 2SC4099 2SC4176 2SC4177 2SC4178	1F 1F 1F 1F 1F 1F 1F 1F 1F

NAME		L
2SD	2SD1819	1F
2SJ	2SJ146	2F
2SK	2SK198 2SK620 2SK665	3F 2F 2F
3SK	3SK179	4F
DIODE		
D	DAN202U DAP202U DA204U	1H 2H 6H
E	ERA81-004	4H
F	FMN1	2I
I	IMN10	3I
M	MA141K MA141WA MA141WK MA143 MA184 MA185 MA3075H MA704 MA716	5I 2H 1H 6H 5H 5H 1I 5H 7H
R	RD5.6EB2 RD6.8EB2 RD7.5M RD7.5MB3 RD8.2EB2 RD8.2EBS RD8.2MB2	4I 4I 1I 1I 4I 4I 1I
	1SS133	5H

	IC					TRANSISTOR		DIODE	
	A	B	C	D	E	F	G	H	I
1									
2									
3									
4									
5									
6				1 OUT 2. Vcc 3. IN 4. IN 5. GND 					
7									
8									

4-38

SECTION 5
EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

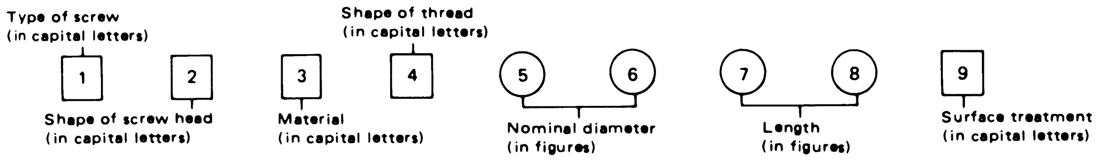
Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

NOTE :
[M] indicates mechanical symbol number.

5.1 STANDARD PART NUMBER CODING

5.1.1 Screw coding

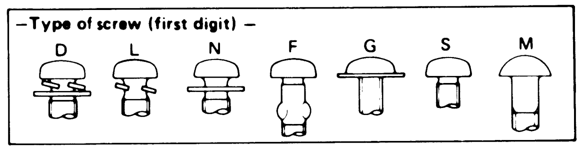
Standard screw part numbers are as follows.


Type of screw
(in capital letters)
Shape of thread
(in capital letters)
1
2
3
4
5
6
7
8
9
Shape of screw head
(in capital letters)
Material
(in capital letters)
Nominal diameter
(in figures)
Length
(in figures)
Surface treatment
(in capital letters)

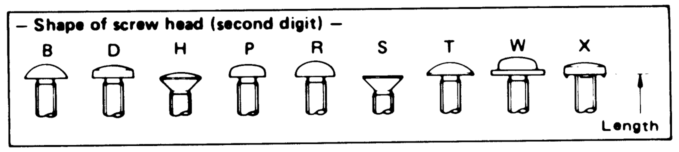
Type of screw (first digit)
- S Normal screws
- D Assembled machine screws (with plain and spring washers)
- L '' (with spring washer)
- N '' (with plain washer)
- F Feather screws
- G Washer head tapping screws
- M Wood screws

Shape of screw head (second digit)
- B Brazier head
- D Binding head
- H Oval countersunk head
- P Pan head
- R Round head
- S Flat head
- T Truss head
- W Washer head (machine screws)
- X Toothed head

–Type of screw (first digit) –



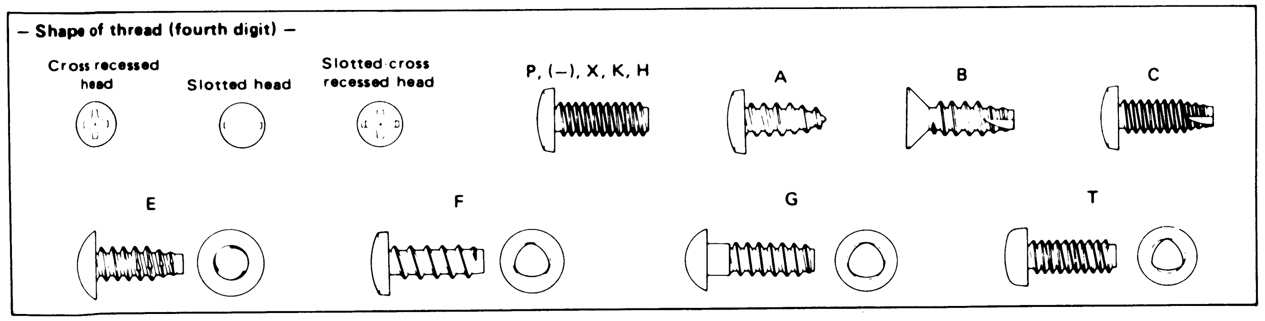
– Shape of screw head (second digit) –


B
D
H
P
R
S
T
W
X
Length

Material (third digit)
- S Steel
- E Stainless steel
- C Cast iron
- U Copper
- B Brass
- P Phosphor bronze
- N Nickel silver
- Y Cast brass
- A Aluminum
- Z Zinc alloy
- K Polycarbonate

Shape of thread (fourth digit)
- P Cross recessed head screws
- (–) Slotted head machine screws
- X Slotted-cross recessed head machine screws
- K Cross recessed head machine screws for precision equipment (type 1)
- H '' (type 3)
- A Cross recessed head tapping screws (type 1)
- B '' (type 2)
- C '' (type 3)
- E Cross recessed head special tapping screws (brand : evertight)
- F '' (brand : P-tight)
- T '' (brand : taptight)
- G ''

– Shape of thread (fourth digit) –


Cross recessed head
Slotted head
Slotted cross recessed head
P, (–), X, K, H
A
B
C
E
F
G
T

Nominal diameter (fifth and sixth digits)

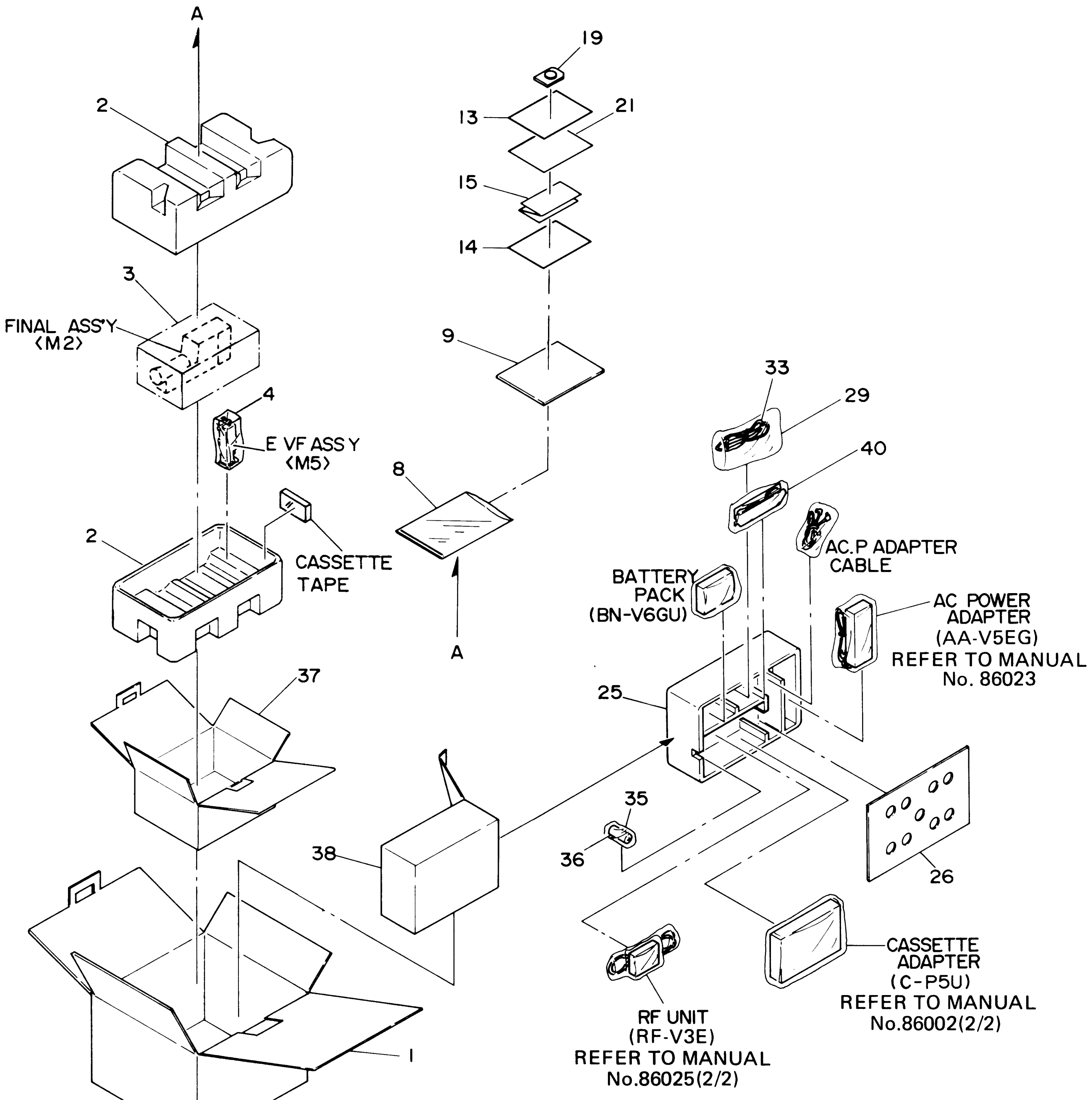
The fifth and sixth digits indicate a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

Length (seventh and eighth digits)

The seventh and eighth digits indicate length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

Surface treatment (ninth digit)
- Z Dichromate treatment after galvanizing (MFZn II-C)
- N Nickel plating (MFNi II, MFNi I)
- R Chromium plating (MBCr II, MBCr I)
- G Silver plating (SP4)
- B Black coating after plating
- F Blackening of iron (FB)
- M Blackening after galvanizing
- K Pickling of brass (PF2)
- P Phosphate treatment
- W Uni-chrome plating
- L Coated with transparent paint
- A Colored red after galvanizing (MFZn II-C)
- C Colored blue after galvanizing (MFZn II-C)
- T Colored green after galvanizing (MFZn II-C)
- V Colored purple after galvanizing (MFZn II-C)

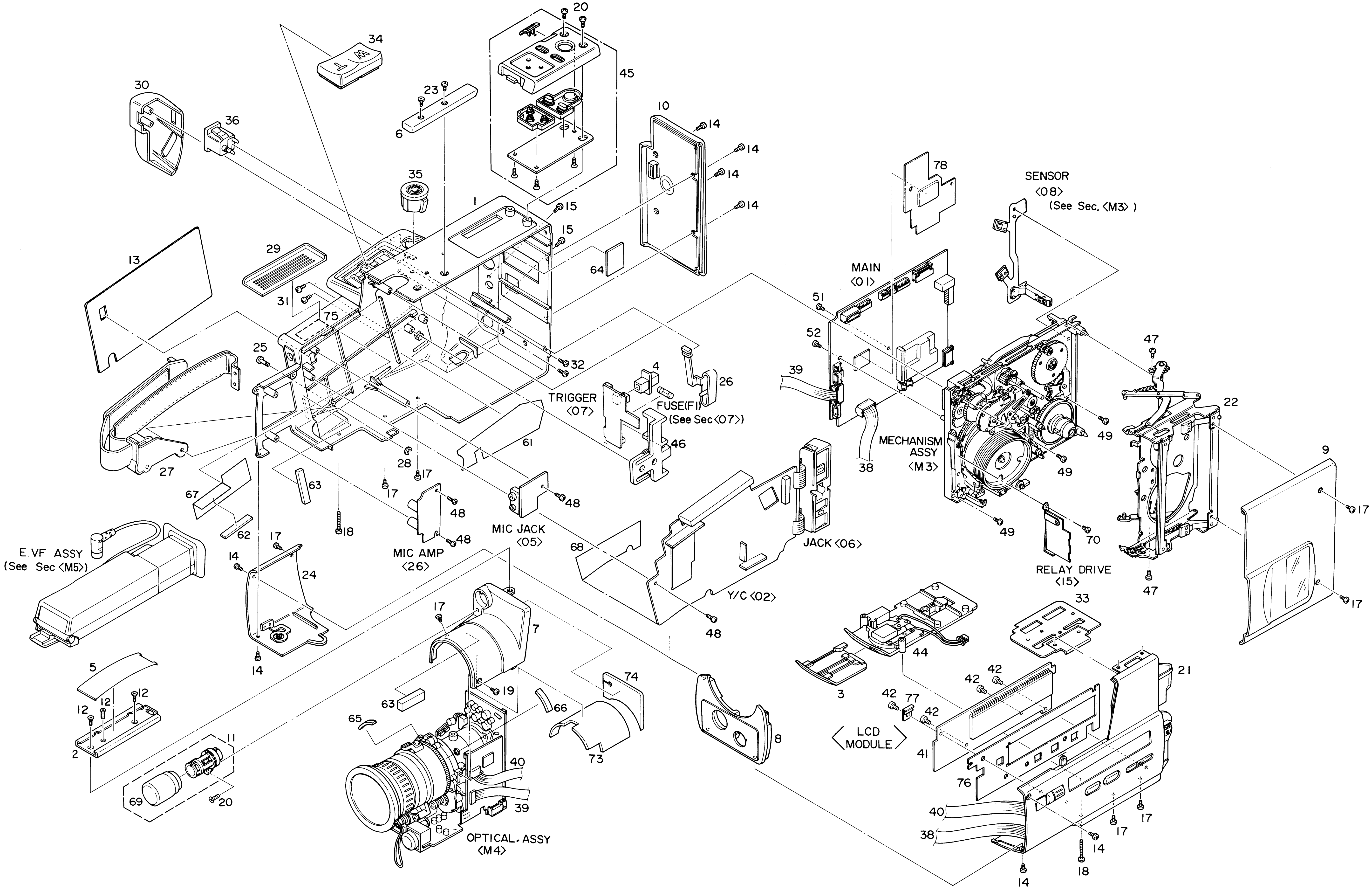
5.2 PACKING ASSEMBLY <M1>


A
19
2
13
21
15
14
3
FINAL ASS'Y
<M2>
9
33
29
4
E VF ASSY
<M5>
8
40
AC.P ADAPTER
CABLE
2
CASSETTE
TAPE
BATTERY
PACK
(BN-V6GU)
AC POWER
ADAPTER
(AA-V5EG)
REFER TO MANUAL
No. 86023
A
37
25
35
36
38
26
CASSETTE
ADAPTER
(C-P5U)
REFER TO MANUAL
No.86002(2/2)
RF UNIT
(RF-V3E)
REFER TO MANUAL
No.86025(2/2)
1

****
* 1. PACKING ASSEMBLY <M1> *
****

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	1	YQ30129-5	PACKING CASE,EK
		YQ30129-4	PACKING CASE,EG
	2	YU30048A-1	CUSHION ASSY
	3	YQM30021-7	POLY BAG
	4	YQM30021-2	POLY BAG
	8	QPGA025-03505	POLY BAG,EG
		PQM30023-5	POLY BAG,EK
⚠	9	YU30052-17	INSTRUCTIONS,EG
⚠		YU30052-18	INSTRUCTIONS,EK
⚠	13	-	DBP INF SHEET,EG ONLY
	14	BT-20066	E.DISTRI.LIST,EK ONLY
	15	BT-20060	GUARANTY CARD,EK ONLY
⚠	19	YU40197-2-1	BATTERY
	21	TCN-3379	TAPE CATALOGUE
	25	YQ20079	ACCESSORY TRAY
	26	YQ40493	ACCESSORY TRAY SHEET
	29	QPGA015-02505	POLY BAG
⚠	33	PU59167-3	CABLE ASSY
	35	PQM30021-48	POLY BAG
	36	UM-3DJ	BATTERY
	37	YQ30151-3	PACKING CASE
	38	YQ40490-4	CASE
⚠	40	YQ10051A	SHOULDER STRAP

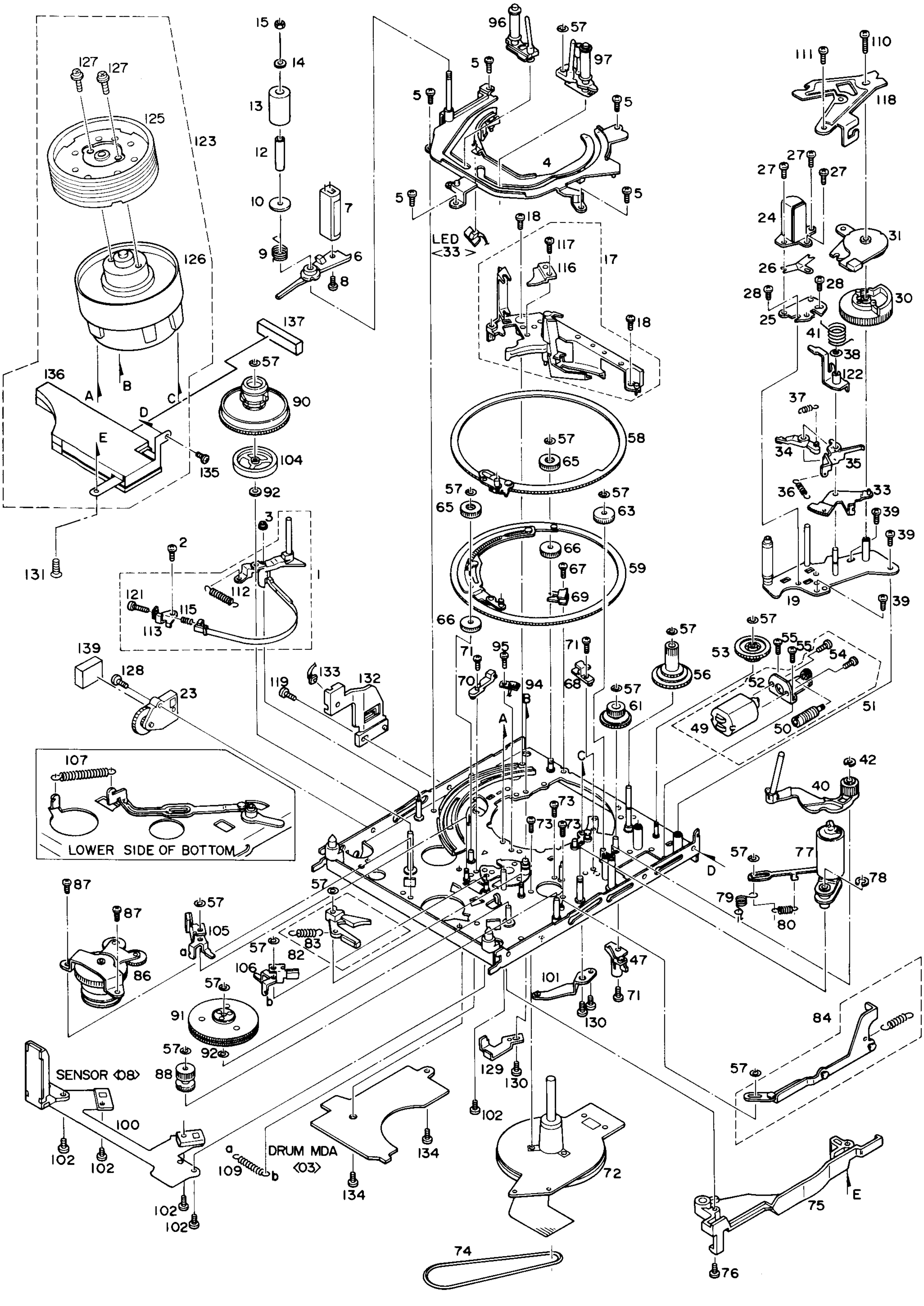
5.3 FINAL ASSEMBLY < M2 >


20
34
45
30
36
23
6
10
14
14
14
14
35
1
15
15
78
SENSOR
<08>
(See Sec. <M3>)
13
29
64
MAIN
<01>
31
75
51
52
47
25
32
4
26
39
TRIGGER
<07>
FUSE(F1)
(See Sec<07>)
22
49
MECHANISM
ASSY
<M3>
46
27
61
28
17
17
38
49
9
67
63
48
MIC JACK
<05>
48
17
70
62
18
48
49
JACK <06>
68
E.VF ASSY
(See Sec <M5>)
MIC AMP
<26>
14
17
24
RELAY DRIVE
<15>
47
Y/C <02>
17
17
7
33
48
44
21
5
19
74
3
42
42
12
12
12
63
42
77
42
66
11
65
40
8
LCD
MODULE
41
2
73
76
69
20
39
40
OPTICAL ASSY
<M4>
38
14
17
17
18
14

2. FINAL ASSEMBLY <M2>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
⚠	1	YQ10037G-11	LOWER CASE ASSY, INCL. 24–32, 75
	2	YQ40419-1-2	SHOE
	3	YQ30092-6	B.U.BATT.COVER
	4	YQ40418-2	ALARM KNOB
	5	YQ40420-1-2	SHOE SPRING
	6	YQ40421-1-1	DECO PLATE
⚠	7	YQ30158A-1	FRONT COVER ASSY, INCL. 73, 74
⚠	8	YQ30064-2	FRONT PANEL
⚠	9	YQ30104E-7	CASS.COVER ASSY
	10	YQ20073-6-9	OPERATION UNIT
	11	YU40196-4	MICROPHONE ASSY, INCL. 69
	12	SSSP2005D	SCREW,X3
	13	YU20027-3	B.BASE SHEET
	14	YQM30032-2-2	SPECIAL SCREW,X8
	15	YQM30032-6-2	SPECIAL SCREW,X2
	17	YQM30032-1-2	SPECIAL SCREW,X8
	18	YQM30032-7-2	SPECIAL SCREW,X2
	19	YQM30032-9	SPECIAL SCREW
	20	YQM30032-4-2	SPECIAL SCREW,X3
⚠	21	YQ10038C-8	UPPER CASE ASSY
	22	YQ20068B-3	CASS.HOUSING ASSY
	23	YQM30032-16-2	SPECIAL SCREW,X2
	24	YQ20062-8-9	SIDE PANEL
	25	YQ40413	STUD
	26	YQ30091-1-4	BUTTON(TRIGGER)
	27	YQ20064C-9	GRIP BELT ASSY
	28	REE2500	E.RING
	29	YQ30162	GRIP RUBER
	30	YQ30098-7-8	FINGER REST
	31	SSSP2006D	SCREW,X2
	32	SDSF2006Z	TAPPING SCREW,X2
	33	YQ40417	SHOE BRACKET
	34	YU40204-2	ZOOM SWITCH
	35	PU59008	8PIN CONNECTOR
	36	PU59862-1-1	DC JACK
	38	YU40210-2	FLAT WIRE3
		OR YU40333	FLAT WIRE3
		OR YU40330	FLAT WIRE3
	39	YU40211-3	FLAT WIRE4
	40	YU40212-3	FLAT WIRE5
		OR YU40335	FLAT WIRE5
		OR YU40332	FLAT WIRE5
	41	YU40242-4-1	LCD MODULE
	42	SDSF2005Z	TAPPING SCREW,X4
	44	YQ30099A-2	BASE ASSY
	45	YQ30059-15	DATE UNIT
	46	YQ30090-1-1	TRG.P.STOPPER
	47	SPSK1730M	SCREW,X2
	48	SDSF2006Z	TAPPING SCREW,X4
	49	SPSG2608Z	SCREW,X3
	51	SPSH1740Z	SCREW
	52	SPSG2004M	SCREW
	61	YQ40545	SHIELD SPACER 2
	62	YQM30029-8	SPACER
	63	YQM30029-7	SPACER,X2
	64	YQM30029-9	SPACER
	65	YQM30029-4	SPACER
	66	YQM30029-5	SPACER
	67	YQ40544	SHIELD SPACER 1
	68	YU40418	Y/C SHEET
	69	YU40196-001	WINDOW SCREEN
	70	SPSH1725M	SCREW
	73	YQ40527	SHIELD (1)
	74	YQ40528-1-1	SHIELD (2)
	75	YQ40546	SHIELD SPACER 3
	76	YQ30175-1-1	SHIELD PLATE
	77	YQ40569	EARTH CLIP
	78	YQ30195	SHIELD PLATE

5.4 MECHANISM ASSEMBLY < M3 >



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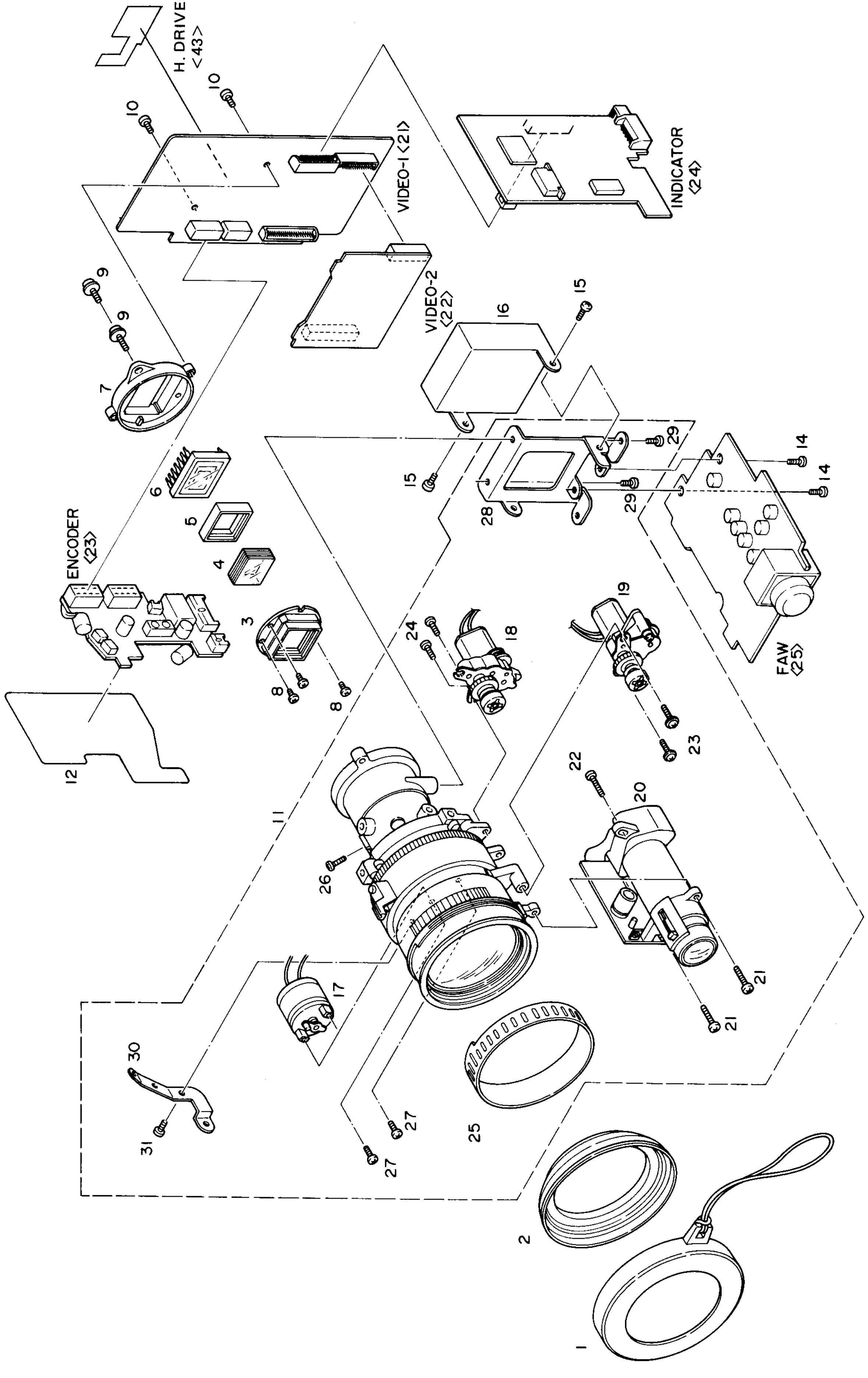
3. MECHANISM ASSEMBLY <M3>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	1	YQ40389A-2	T.SERVO ASSY,INC112-3,115,121
	2	SPSK1730M	SCREW
	3	YQ40059	CAP
	4	YQ40387A-1	GUIDE RAIL ASSY
	5	SPSH1725M	SCREW,X5
	6	YQ20050-1-5	FE HEAD ARM
	7	YU40448	FULL ERASE HEAD
	8	SPSK1630M	SCREW
	9	YQ40391-1-2	TORSION SPRING
	10	YQ40063	FLANGE
	12	YQ40498-1-1	COLLAR
	13	YQ40497-1-1	IMPEDANCE ROLLER(2)
	14	YQ40556	SPACER
	15	PQ42708	NUT
	17	YQ40066A-6	UV BASE ASSY,INCL.116,117
	18	SPSH1730M	MINI SCREW,X2
	19	YQ40343A-3	SUB DECK ASSY
	23	YU40001	DAMPER
	24	YU40232	AUDIO/CONTROL HEAD
	25	YQ40353	X PLATE
	26	YQ40354	HEAD SPRING
	27	SPSK1730M	SCREW,X3
	28	SPSK1720M	MINI SCREW,X2
	30	YQ20057	CAM GEAR
	31	YU40233	CAM ENCODER
	33	YQ40356A-1	ARM GEAR ASSY
	34	YQ40358	LOCK ARM 1
	35	YQ40359	LOCK ARM 2
	36	YQ40342	TENSION SPRING
	37	YQ40362	TENSION SPRING
	38	PQM30017-25	SLIT WASHER
	39	SPSH1725M	SCREW,X3
	40	YQ40364A-2	MIDDLE POLE ASSY
	41	YQ40361	TORSION SPRING
	42	PQM30017-23	SLIT WASHER
	47	YQ40553	LOADING GUIDE
⚠	49	YU40258G-2	LOADING MOTOR
	50	YQ40103A	WORM ASSY
	51	YQ40340A-2	L.MOTOR BKT AY,INCL49,50,52,54
	52	YQ40341A-2	LOADING MOTOR BKT ASSY
	53	YQ40108	WORM WHEEL
	54	SPSK1720M	MINI SCREW,X2
	55	SPSK1725M	SCREW,X2
	56	YQ40109	TERMINAL GEAR
	57	PQM30017-27	SLIT WASHER,X15
	58	YQ40232A-1	SUP LOADING RING ASSY
	59	YQ40115A-3	TU LOADING RING ASSY
	61	YQ40122-1-2	LOADING GEAR 1
	63	YQ40123	LOADING GEAR 2
	65	YQ40124	RING GUIDE GEAR(S),X2
	66	YQ40125	RING GUIDE GEAR (T), X2
	67	SPSK1725M	SCREW
	68	YQ40126	RING GUIDE 1
	69	YQ40127	RING GUIDE 2
	70	YQ40128	RING GUIDE 3
	71	SPSH1725M	SCREW,X3
⚠	72	YU40235V	CAPSTAN MOTOR ASSY
⚠	OR	YU40235V-2	CAPSTAN MOTOR ASSY
	73	SPSH1725M	SCREW,X3
	74	YQM30003-2	BELT
	75	YQ30082-1-1	CAPSTAN MOTOR COVER
	76	SPSH1740M	SCREW
	77	YQ40366A-3	PINCH ROLLER ARM ASSY,INCL.80
	78	REE2500	"E" RING
	79	YQ40483-1-2	TORSION SPRING
	80	YQ40481	TENSION SPRING
	82	YQ40381A-2	SEARCH BRAKE ASSY, INCL. 83
	83	YQ40383	TENSION SPRING
	84	YQ40384A-1	SEARCH BRAKE LEVER ASSY
	86	YU40007-2	CENTER PULLEY BRACKET ASSY
	87	SPSH1725M	SCREW,X2
	88	YQ40147-1-1	TAKE-UP GEAR
	90	YU40239-1-1	SUP R.DISC ASSY
	91	YU40240	TU CLUTCH ASSY
	92	Q03093-835	WASHER,X2
	94	YU40234	DEW SENSOR
	95	SPSH1725M	SCREW
	96	YQ40083C-5	SUP POLE BASE ASSY
	97	YQ40093A-9	TU POLE BASE ASSY
	100	YS40012E	SENSOR BOARD ASSY
	101	YU40241	BRUSH
	102	SPSH1730M	MINI SCREW,X5
	104	YU40286	SUP B.REEL ASSY
	105	YQ40376A-1	MAIN BRAKE ASSY (SUPPLY)
	106	YQ40378A-1	MAIN BRAKE ASSY(TU)
	107	YQ40385	TENSION SPRING
	109	YQ40380	TENSION SPRING
	110	SPSH1780M	SCREW
	111	SPSH1725M	SCREW
	112	YQM30001-13-1	TENSION SPRING
	113	YQ40266	ADJUST PLATE
	115	YQM30002-1	COMPRESSION SPRING
	116	YQ40068-1-1	POLE BASE GUIDE
	117	SPSH1730M	MINI SCREW
	118	YQ30081-1-1	MIDDLE POLE STOPPER
	119	SPSH1740M	SCREW
	121	SPSK1780M	MINI SCREW
	122	YQ40352A-2	LOCK ARM 3 ASSY
⚠	123	YDV2005A-3	DRUM ASSY,INCL.125-127,136
	125	YDM2013A-3	UPPER DRUM ASSY
	126	YDM2015B	LOWER DRUM MOTOR ASSY
	127	PQ41535-4	SCREW,X2
	128	SPSH1760M	SCREW
	129	YQ40256	SHIELD COVER
	130	SPSH1730M	MINI SCREW,X3
	131	PQ41450	SCREW
	132	YQ30113	E.SENS.BRACKET
	133	TPS605	PHOTO TRANSISTOR
	134	PQ41450-2	SCREW,X2
	135	SPSH1720M	SCREW
	136	TME244A	PRE/REC AMP
	137	YQM30029-6	SPACER
	139	YQ40520	DAMPER COVER

5.5 OPTICAL BLOCK ASSEMBLY < M4 >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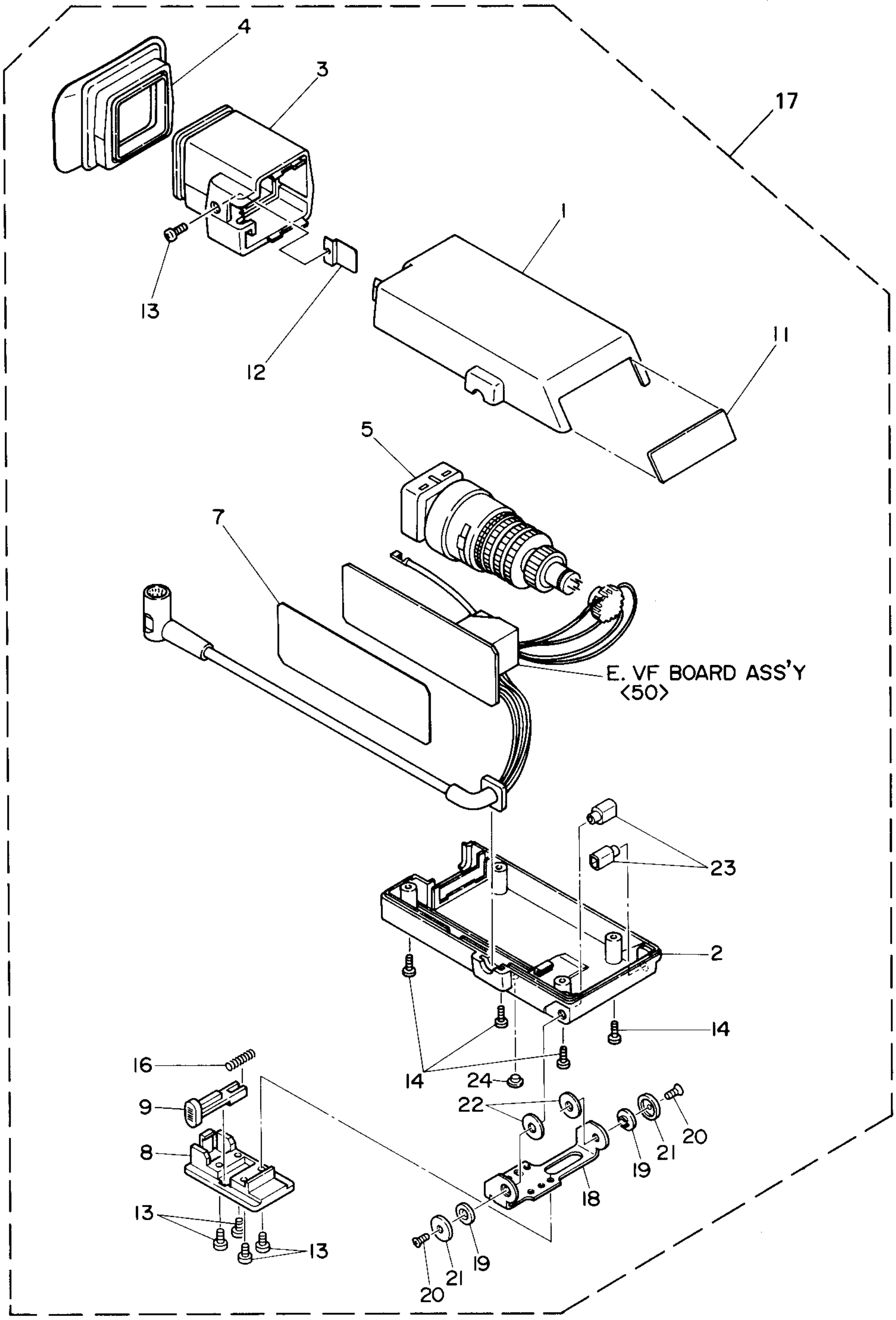
4. OPTICAL BLOCK ASSEMBLY <M4>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	1	YQ40437A	HOOD CAP ASSY
	2	YU40190	HOOD
	3	YQ30096	OPTICAL LPF HOLDER
	4	YU40402	OPTICAL LPF
	5	PQ42339	SPACER RUBBER
	6	UPD3556D	IC(CCD)
	7	YQ30095	IMAGER HOLDER
	8	SPSK2004F	MINI SCREW,X3
	9	DPSP2008Z	SCREW,X2
	10	SPSP2004Z	SCREW,X2
	11	YU40189-2	OPTICAL BLOCK ASSY, INCL. 17–31
	12	YU30130-1-2	SHIELD PLATE
	14	SPSH1740Z	SCREW,X2
	15	SPSH1740Z	SCREW,X2
	16	YU40200-2	DC-DC CONVERTER
	17	YU40189-001	IRIS MOTOR
	18	YU40189-002	ZOOM SENSOR
	19	YU40189-003	AUTO FOCUS MOTOR
	20	YU40189-004	LCD SENSOR
	21	YU40189-005	SCREW,X2
	22	YU40189-006	SCREW
	23	YU40189-007	SCREW,X2
	24	YU40189-008	SCREW,X2
	25	YU40189-009	RABBER
	26	YU40189-010	SCREW
	27	YU40189-011	SCREW,X2
	28	YQ40431	OP BRACKET
	29	SDSF2605Z	TAPPING SCREW,X2
	30	YQ40432-1-1	LENS BRACKET
	31	SDSF2605Z	TAPPING SCREW

5.6 ELECTRONIC VIEWFINDER ASSEMBLY < M5 >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    *      5. ELECTRICAL VIEFINDER ASSEMBLY <M5>    *
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*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
⚠	1	YU40356	TOP CASE
⚠	2	YU40357	BOTTOM CASE
	3	YU40374	LENS ASSY
	4	YU40384	EYE CAP
⚠	5	YU40349	CRT/DY ASSY
	7	YU40376	INSULATOR
	8	YU40360	SHOE
	9	YU40361-2	LEVER
	11	YQ30121-9	E-VF MARK
	12	YU40383	PLATE SPRING
	13	YU40363	SCREW(C),X5
	14	YU40373	SCREW(A),X4
	16	YU40362	SPRING
⚠	17	YU30045G-6	E. VIEWFINDER AY, INCL. 1–16, 18–24
	18	YU40359	ARM
	19	YU40364	SPACER, X2
	20	YU40476	SCREW(B),X2
	21	YQ40573	COVER,X2
	22	YU40365	BUSHING,X2
	23	YU40367	LEVER PIN,X2
	24	YU40542	CAP

SECTION 6
ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

RESISTORS— All resistance values are in ohms (Ω), unless otherwise indicated.

k	: 1,000 (Kilo)
M	: 1,000,000 (Mega)
Chip R	: Chip Resistor
Chip VR	: Chip Variable Resistor
Comp. R	: Composition Resistor
CR	: Carbon Film Resistor
FR	: Fusible Resistor
MFR	: Metal Film Resistor
MPR	: Metal Plate Resistor
OMR	: Oxide Metal Film Resistor
PMR	: Precision Metal Film Resistor
UFR	: Unflammable Resistor
VR	: Variable Resistor (Potentiometer)
WR	: Wire Wound Resistor

CAPACITORS—All capacitance values are in μF, unless otherwise indicated.

pF	: μμF (Pico farad)
C Cap	: Caramic Capacitor
Chip Cap	: Chip Capacitor
Chip T Cap	: Chip Tantalum Capacitor
E Cap	: Electrolytic Capacitor
FM Cap	: Film Mica Capacitor
LL Cap	: Low Leak Current Electrolytic Capacitor
MM Cap	: Metalized Mylar Capacitor
MP Cap	: Metalized Paper Capacitor
MY Cap	: Mylar Capacitor
NP Cap	: Non-polar Capacitor
PC Cap	: Polycarbonate Capacitor
PP Cap	: Polypropylene Capacitor
PS Cap	: Polystyrol Capacitor
T Cap	: Tantalum Capacitor
TF Cap	: Thin Film Capacitor
TR Cap	: Trimmer Capacitor

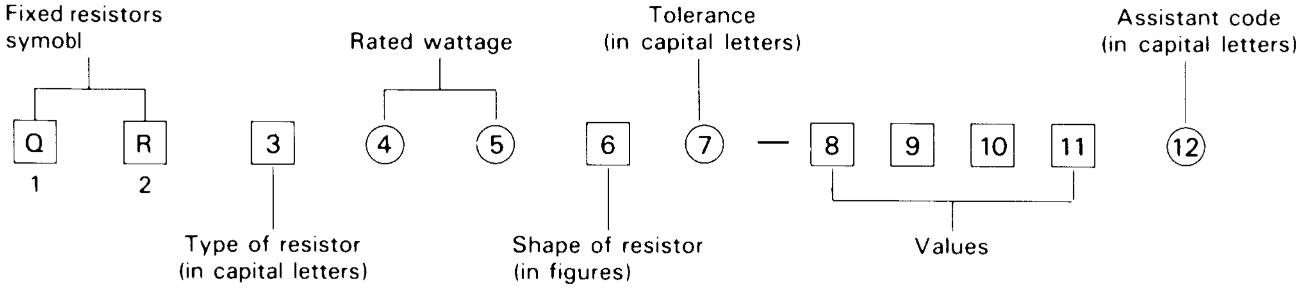
NOTES:

- [2 digits] indicates circuit board symbol number.
- "X " indicates quantity per set.

6.1 STANDARD PART NUMBER CODING

6.1.1 Fixed resistor coding

Fixed resistor part numbers are as follows.


Fixed resistors symobl
Rated wattage
Tolerance (in capital letters)
Assistant code (in capital letters)
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12
Type of resistor (in capital letters)
Shape of resistor (in figures)
Values

Type of resistor (third digit)

C	Composition resistors
D	Carbon film resistors
F	Unflammable resistors
G	Oxide metal film resistors
H	Fusible resistors
M	Metal plate resistors
S	Metal glazed resistors
V	Precision metal film resistors
W	Wire wound resistors
X	Metal film resistors
Z	Special resistors

Rated wattage (fourth and fifth digits)

A0	1/10 W
18	1/8 W
16	1/6 W
14	1/4 W
12	1/2 W
01	1 W
02	2 W
03	3 W
04	4 W
05	5 W
06	6 W
07	7 W
75	7.5 W
08	8 W
10	10 W
15	15 W
A6	16 W
20	20 W
30	30 W

Tolerance (seventh digit)

F	± 1 %
G	± 2 %
J	± 5 %
K	± 10 %
M	± 20 %

Assistant code (twelfth digit)

A	Small type
B	Small type
S	Small type
Y	Lead taping
Z	Lead taping

Values (eighth – tenth or eleventh digits)

examples:

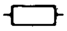
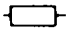
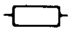
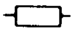
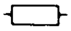
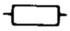
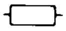
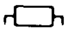
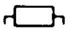
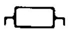
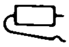
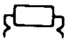
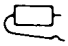
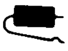
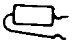
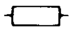
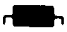
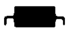
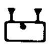
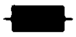
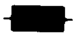
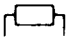
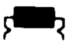
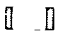
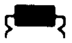
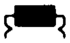
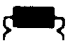
R47		0.47 Ω
4R7		4.7 Ω
470	47×10^{0}	47 Ω
471	47×10^{1}	470 Ω
472	47×10^{2}	4.7 kΩ
473	47×10^{3}	47 kΩ
474	47×10^{4}	470 kΩ
475	47×10^{5}	4.7 MΩ

QRV resistance shown by four digits:

4640	464×10^{0}	464 Ω
4641	464×10^{1}	4.64 kΩ
4642	464×10^{2}	46.4 kΩ

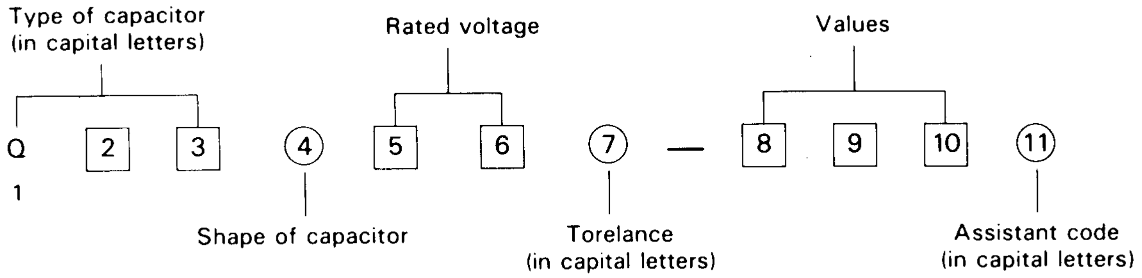
Shape of resistor (sixth digit)

Note: ■ indicates flame retardant resistor.

Type of resistor / Shape of resistor	C	D	F	G	H	M	S	V	W	X
1										
2										
3										
4										
5									(L) type	
6										
7			Lug (B) type							
8			Lug (A) type				 Chip			
9			Lug (C) type							

6.1.2 Fixed capacitor coding

Fixed capacitor part numbers are as follows.


Type of capacitor
(in capital letters)
Rated voltage
Values
Q
2
3
4
5
6
7
—
8
9
10
11
1
Shape of capacitor
Torelance
(in capital letters)
Assistant code
(in capital letters)

Ceramic capacitors

Type of capacitor (first — third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Mono-direction	Kink lead	Axial lead	Axial forming lead	Chip
QCC	Ceramic	1		4	5	
QCD	High capacitance					A
QCF	High capacitance	1,4	3			8,A
QCS	Temperature compensation	1	3	4	5	8,A
QCT	Temperature compensation	Special coding				8,A
QCV	Ceramic			1	3	
QCX	Ceramic			1	3	
QCY	High capacitance	1,4	3	6	7	8,A
QCZ	Special type	Special coding				
QCB	Ceramic			B	C	

Electrolytic capacitors

Type of capacitor (first-third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Tubular	Mono-direction	Anti-stress	Forming	Snap-in
QEB	Low leakage		4	5	6	
QEC	Low leakage		4,8,A	9,B	6,C	
QEE	Tantalum (normal)		4	5	6	
	Tantalum (small)		8			
QEF	Chip tantalum	8 (chip type)				
QEG	Low impedance		4			
QEK	Miniature type		4	5	6	
QEL	Small type		4	5	6	7
QEM	Small type		4,A	5	6	
QEN	Non-polar	2	4	5	6	
QEP	Non-polar (small)		4,A	5,B	6,C	
QER	Miniature type		4	5	6	
QET	Small type	2	4,A	5,B	6,C	7
QEU	Small type		4	5	6	
QEV	Small type		4		6	7
QEW	Normal	2	4	5	6	7

Paper film capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
		Tubular	Normal		Flame retardant	
Symbol	Characteristics		Mono-direction	Kink lead	Mono-direction	Kink lead
QFA	Metalized polypropylene				7	
QFE	Metalized mylar				5	
QFF	Film mica		4			
QFG	Polypropylene film		4	8		
QFH	Metalized mylar	2	4	3	5,7	6
QFJ	Mylar (special)		4			
QFK	Metalized mylar (small)				5	
QFM	Mylar	2	4	3,7	5	6
QFN	Mylar (small)		4	3		
QFP	Polypropylene		4	3,8		
QFS	Polystyrole	2	4	3		
QFV	Thin film		4	8		
QFZ	Special type	Special coding				

Rated voltage (fifth and sixth digits)

Sixth digit / Fifth digit	A	B	C	D	E	F	G	H	J	K	V	W	X
0						3.15	4.0		6.3				
1	10		16	20	25		40	50	63	80	35		
2	100	125	160	200	250	315	400	500	630		350	450	600
3	1000	1250		2000				5000					

Tolerance (seventh digit)

A	$^{+100}_{-10}$ %	M	±20 %
F	±1 %	N	±30 %
G	±2 %	P	$^{+100}_{-0}$ %
H	$^{+50}_{-10}$ %	R	$^{+30}_{-10}$ %
J	±5 %	X	$^{+40}_{-20}$ %
K	±10 %	Z	$^{+80}_{-20}$ %

Values (eighth – tenth digits)

Example : Values are in picofarads

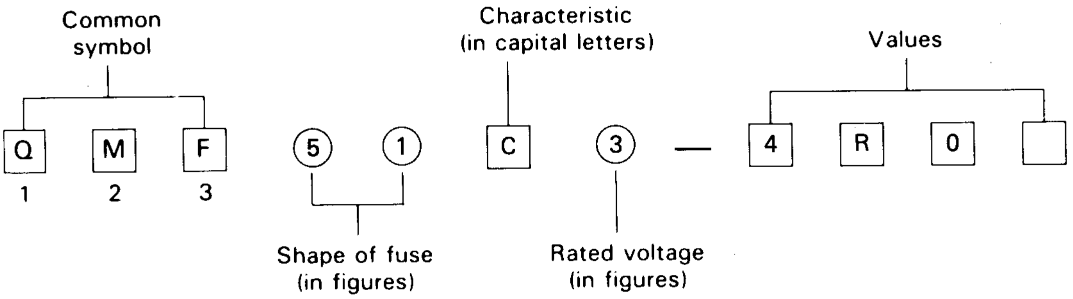
101	10×10^1 pF	100 pF
102	10×10^2 pF	1,000 pF (0.001 μF)
103	10×10^3 pF	10,000 pF (0.01 μF)
104	10×10^4 pF	100,000 pF (0.1 μF)
105	10×10^5 pF	1 μF
5R0		5.0 pF

Assistant code (eleventh digit)

G	Small size
Z	Lead taping
Y	Lead taping

6.1.3 Fuse coding

Standard fuse part numbers are as follows.


Common symbol
Characteristic (in capital letters)
Values
Q
M
F
1
2
3
⑤
①
C
③
—
4
R
0
Shape of fuse (in figures)
Rated voltage (in figures)

Shape of fuse
(fourth and fifth digits)

51	φ5.2 × 20 mm
60	φ6.4 × 30 mm
61	φ6.35 × 31.8 mm
63	φ6.4 × 30 mm with lead wires
66	φ6.35 × 31.8 mm with lead wires
00	Special type

Rated voltage
(seventh digit)

1	AC125 V
2	AC250 V
3	0.1 – 1 A : AC250 V 1.25 – 6.3 A : AC125 V

Values
(eighth-tenth or eleventh digits)
example:
R63 .... 0.63 A
1R0 .... 1.0 A
2R5 .... 2.5 A
100 .... 10 A
R315 .... 0.315 A
1R25 .... 1.25 A

Characteristics (sixth digit)

Symbol	Fusing Current	Fusing Time	Remarks
A	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
B	210 %	Within 30 min.	Regular fusible type (for SEMKO, Europe)
	275 %	0.05 – 2 sec.	
	400 %	0.01 – 0.3 sec.	
C	135 %	Within 1 hr.	Regular fusible type (for UL, Japan)
	200 %	Within 2 min.	
E	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
J	135 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
M	135 %	Within 1 hr.	Regular fusible type (for UL)
	200 %	Within 2 min.	
R	160 %	Within 1 hr.	Regular fusible type
	200 %	Within 2 min.	
S	160 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
	700 % – 2000 %	Within 0.01 sec.	
U	135 %	Within 1 hr.	Anti-rush type (for UL)
	200 %	Within 2 min.	
	800 % – 2000 %	Within 0.01 sec.	

7. MAIN BOARD ASSEMBLY <01>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB10002G-01	MAIN BOARD ASSY
	IC1	S-81250AG	IC
	IC2	M5236ML	IC
	IC3	BA6993F	IC
	IC101	BU3721K	IC
	IC102	M51799FP	IC
	IC103	M52410FP	IC
	IC104	NJM2904E	IC
	IC105	VC5026G	IC
	IC106	AFZ74A002X1	IC
	IC107	BU4011BF	IC
	IC301	BA7757K	IC
⚠	IC401	HD6305Z0F-CV05	IC
⚠	OR	HD63705Z0F-CV05	IC
⚠	OR	HD6305Z0F-CV06	IC
	IC402	S8054HN-CB	IC
	IC403	BU4584BF	IC
	IC404	M54543ASL-A	IC
	Q1	2SB1009(PQ)	TRANSISTOR
	Q2	DTA124EU	TRANSISTOR
	Q3	DTC144EU	TRANSISTOR
	Q4	2SJ146	TRANSISTOR
	Q5	2SJ146	TRANSISTOR
	Q103	2SC4081	TRANSISTOR
	OR	2SD1819	TRANSISTOR
	Q106	2SK665	TRANSISTOR
	Q110	DTC144EU	TRANSISTOR
	Q111	2SK665	TRANSISTOR
	Q112	DTC144EU	TRANSISTOR
	Q113	2SK665	TRANSISTOR
	Q114	FMG2	TRANSISTOR
	Q120	DTC144EU	TRANSISTOR
	Q121	DTC144EU	TRANSISTOR
	Q122	DTC144EU	TRANSISTOR
	Q125	2SB798(LK)	TRANSISTOR
	Q126	2SB798(LK)	TRANSISTOR
	Q127	2SB798(LK)	TRANSISTOR
	Q130	2SC4081	TRANSISTOR
	OR	2SD1819	TRANSISTOR
	Q131	FMG2	TRANSISTOR
	Q302	DTA124EU	TRANSISTOR
	Q303	FMW3	TRANSISTOR
	Q304	2SC4081(S)	TRANSISTOR
	Q305	2SC4081(S)	TRANSISTOR
	Q306	2SA1036K(QR)	TRANSISTOR
	Q307	2SA1036K(QR)	TRANSISTOR
	Q308	DTC144EU	TRANSISTOR
	Q309	FMG1	TRANSISTOR
	Q310	DTC144ES	TRANSISTOR
	Q401	2SK665	TRANSISTOR
	Q402	2SA1576	TRANSISTOR
	Q403	2SK665	TRANSISTOR
	Q404	FMC2	TRANSISTOR
	Q405	2SK665	TRANSISTOR
	Q406	2SK665	TRANSISTOR
	Q407	2SK665	TRANSISTOR
	Q408	2SK665	TRANSISTOR
	Q409	2SK665	TRANSISTOR
	Q410	2SK665	TRANSISTOR
	Q413	2SK665	TRANSISTOR
	Q414	2SK665	TRANSISTOR
	Q415	2SK665	TRANSISTOR
	Q416	2SK665	TRANSISTOR
	Q417	2SA1576	TRANSISTOR
	Q418	2SK665	TRANSISTOR
	Q419	2SK665	TRANSISTOR
	D1	DAN202U	DIODE
	D2	FMN1	DIODE
	D102	MA141WK	DIODE
	OR	DAN202U	DIODE
	D103	MA704	DIODE
	D104	MA141WK	DIODE
	OR	DAN202U	DIODE
	D107	MA141K	DIODE
	D108	MA3075H	ZENER DIODE
	OR	RD7.5MB3	ZENER DIODE
	D401	IMN10	DIODE
	D402	DAP202U	DIODE
	D403	DAP202U	DIODE
	D405	1SS133	DIODE
	R1	QRSA08J-221YN	RESISTOR
	R3	QRSA08J-822YN	RESISTOR
	R4	NVP1301-102N	V RESISTOR,REG 8V ADJ
	R5	NRSA63J-104N	RESISTOR
	R6	NRSA63J-154N	RESISTOR
	R7	NRSA63J-104N	RESISTOR
	R8	NRSA63J-154N	RESISTOR
	R9	NRSA63J-104N	RESISTOR
	R11	NRSA63J-104N	RESISTOR
	R12	NRSA63J-104N	RESISTOR
	R13	NRSA63J-103N	RESISTOR
	R14	NRSA63J-103N	RESISTOR
	R15	NRSA63J-123N	RESISTOR
	R16	NRSA63J-0R0A	RESISTOR
	R17	NRSA63J-105N	RESISTOR
	R19	QRSA08J-102YN	RESISTOR
	R20	NRSA63J-824N	RESISTOR
	R21	NRSA63J-105N	RESISTOR
	R22	NRSA63J-824N	RESISTOR
	R101	YU40174	V RESISTOR,TRACKING VR
	R102	NRSA63J-102N	RESISTOR
	R103	NVP1301-103N	V RESISTOR,TRACKING PRESET
	R104	NRSA63J-102N	RESISTOR
	R105	NRSA63J-103N	RESISTOR
	R111	NRSA63J-102N	RESISTOR
	R112	NRSA63J-103N	RESISTOR
	R114	NRSA63J-102N	RESISTOR
	R116	NRSA63J-394N	RESISTOR
	R117	NRSA63J-103N	RESISTOR
	R118	NRSA63J-103N	RESISTOR
	R119	NRSA63J-471N	RESISTOR
	R120	NRSA63J-105N	RESISTOR
	R121	NRSA63J-222N	RESISTOR
	R126	NRSA63J-562N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R127	NRSA63J-123N	RESISTOR
	R128	NRSA63J-183N	RESISTOR
	R129	NRSA63J-105N	RESISTOR
	R131	NRSA63J-154N	RESISTOR
	R132	NRSA63J-184N	RESISTOR
	R133	NRSA63J-824N	RESISTOR
	R135	NRSA63J-154N	RESISTOR
	R136	NRSA63J-184N	RESISTOR
	R137	NRSA63J-102N	RESISTOR
	R138	NRSA63J-102N	RESISTOR
	R139	NRSA63J-473N	RESISTOR
	R140	NRSA63J-473N	RESISTOR
	R141	NRSA63J-473N	RESISTOR
	R142	NRSA63J-333N	RESISTOR
	R152	NRSA63J-683N	RESISTOR
	R154	NRSA63J-274N	RESISTOR
	R160	NRSA63J-561N	RESISTOR
	R161	QRSA08J-184YN	RESISTOR
	R162	QRSA08J-154YN	RESISTOR
	R163	NRSA63J-334N	RESISTOR
	R164	NRSA63J-563N	RESISTOR
	R166	NRSA63J-0R0A	RESISTOR
	R168	NRSA63J-683N	RESISTOR
	R170	NRSA63J-102N	RESISTOR
	R171	NRSA63J-102N	RESISTOR
	R172	NRSA63J-102N	RESISTOR
	R173	NRSA63J-102N	RESISTOR
	R174	NRSA63J-333N	RESISTOR
	R182	NRSA63J-473N	RESISTOR
	R183	NRSA63J-473N	RESISTOR
	R184	NRSA63J-333N	RESISTOR
	R185	NRSA63J-105N	RESISTOR
	R186	NRSA63J-103N	RESISTOR
	R187	NRSA63J-0R0A	RESISTOR
	R188	NRSA63J-472N	RESISTOR
	R189	NRSA63J-474N	RESISTOR
	R190	NRSA63J-103N	RESISTOR
	R202	NRSA63J-473N	RESISTOR
	R203	NRSA63J-473N	RESISTOR
	R204	NRSA63J-473N	RESISTOR
	R210	NRSA63J-683N	RESISTOR
	R211	NRSA63J-183N	RESISTOR
	R212	NRSA63J-103N	RESISTOR
	R213	NRSA63J-103N	RESISTOR
	R214	NRSA63J-103N	RESISTOR
	R219	NRSA63J-560N	RESISTOR
	R220	NRSA63J-560N	RESISTOR
	R221	NRSA63J-333N	RESISTOR
	R222	NRSA63J-333N	RESISTOR
	R223	NRSA63J-103N	RESISTOR
	R224	NRSA63J-333N	RESISTOR
	R301	NRSA63J-302N	RESISTOR
	R303	NRSA63J-102N	RESISTOR
	R305	NRSA63J-100N	RESISTOR
	R306	NRSA63J-222N	RESISTOR
	R307	NRSA63J-103N	RESISTOR
	R308	NRSA63J-392N	RESISTOR
	R309	NVP1301-103N	V RESISTOR,AUDIO PB LEVEL
	R310	NRSA63J-182N	RESISTOR
	R311	NRSA63J-124N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R312	NRSA63J-121N	RESISTOR
	R313	NRSA63J-223N	RESISTOR
	R314	NRSA63J-470N	RESISTOR
	R315	NRSA63J-185N	RESISTOR
	R316	NRSA63J-822N	RESISTOR
	R317	NRSA63J-223N	RESISTOR
	R318	NRSA63J-223N	RESISTOR
	R320	NRSA63J-471N	RESISTOR
	R321	NRSA63J-272N	RESISTOR
	R322	NRSA63J-121N	RESISTOR
	R323	NRSA63J-273N	RESISTOR
	R324	NRSA63J-102N	RESISTOR
	R325	NRSA63J-0R0A	RESISTOR
	R326	NRSA63J-123N	RESISTOR
	R327	NRSA63J-123N	RESISTOR
	R328	NRSA63J-123N	RESISTOR
	R329	NRSA63J-123N	RESISTOR
	R330	NRSA63J-562N	RESISTOR
	R331	NRSA63J-272N	RESISTOR
	R332	NRSA63J-0R0A	RESISTOR
	R333	NRSA63J-683N	RESISTOR
	R334	NRSA63J-683N	RESISTOR
	R335	NRSA63J-100N	RESISTOR
	R336	NRSA63J-100N	RESISTOR
	R339	NRSA63J-472N	RESISTOR
	R340	NRSA63J-0R0A	RESISTOR
	R341	NRSA63J-0R0A	RESISTOR
	R342	NVP1301-683N	V RESISTOR,AUDIO BIAS LEVEL
	R345	NRSA63J-103N	RESISTOR
	R346	NRSA63J-103N	RESISTOR
	R347	NRSA63J-271N	RESISTOR
	R401	NRSA63J-153N	RESISTOR
	R402	NRSA63J-102N	RESISTOR
	R403	NRSA63J-103N	RESISTOR
	R404	NRSA63J-471N	RESISTOR
	R405	NRSA63J-105N	RESISTOR
	R406	NRSA63J-473N	RESISTOR
	R407	NRSA63J-473N	RESISTOR
	R408	NRSA63J-103N	RESISTOR
	R409	NRSA63J-473N	RESISTOR
	R410	NRSA63J-103N	RESISTOR
	R412	NRSA63J-153N	RESISTOR
	R413	NRSA63J-102N	RESISTOR
	R414	NRSA63J-103N	RESISTOR
	R416	NRSA63J-203N	RESISTOR
	R417	NRSA63J-103N	RESISTOR
	R418	NRSA63J-105N	RESISTOR
	R419	NRSA63J-203N	RESISTOR
	R420	NRSA63J-103N	RESISTOR
	R421	NRSA63J-102N	RESISTOR
	R422	NRSA63J-203N	RESISTOR
	R423	NRSA63J-203N	RESISTOR
	R424	NRSA63J-563N	RESISTOR
	R425	NRSA63J-103N	RESISTOR
	R426	NRSA63J-823N	RESISTOR
	R427	NRSA63J-333N	RESISTOR
	R428	NRSA63J-102N	RESISTOR
	R429	NRSA63J-102N	RESISTOR
	R430	NRSA63J-203N	RESISTOR
	R431	NRSA63J-184N	RESISTOR
	R432	NRSA63J-103N	RESISTOR
	R433	NRSA63J-203N	RESISTOR
	R435	NRSA63J-103N	RESISTOR
	R436	NRSA63J-203N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R437	NRSA63J-203N	RESISTOR
	R439	NRSA63J-472N	RESISTOR
	R441	NRSA63J-203N	RESISTOR
	R443	YU40044-D823YN	RESISTOR
	R444	YU40044-D683YN	RESISTOR
	R445	NRSA63J-102N	RESISTOR
	R446	NRSA63J-102N	RESISTOR
	R447	NRSA63J-153N	RESISTOR
	R448	NRSA63J-102N	RESISTOR
	R449	NRSA63J-153N	RESISTOR
	R450	NRSA63J-102N	RESISTOR
	R451	NRSA63J-153N	RESISTOR
	R453	NRSA63J-0R0A	RESISTOR
	R455	NRSA63J-104N	RESISTOR
	R457	NRSA63J-104N	RESISTOR
	R460	NRSA63J-105N	RESISTOR
	R461	NRSA63J-102N	RESISTOR
	R462	NRSA63J-105N	RESISTOR
	R463	NRSA63J-102N	RESISTOR
	R469	NRSA63J-102N	RESISTOR
	R470	NRSA63J-102N	RESISTOR
	R471	NRSA63J-271N	RESISTOR
	R472	NRSA63J-102N	RESISTOR
	R474	NRSA63J-153N	RESISTOR
	R475	NRSA63J-0R0A	RESISTOR
	R476	NRSA63J-0R0A	RESISTOR
	R477	NRSA63J-102N	RESISTOR
	R478	NRSA63J-102N	RESISTOR
	R479	NRSA63J-102N	RESISTOR
	R480	NRSA63J-102N	RESISTOR
	R481	NRSA63J-102N	RESISTOR
	R482	NRSA63J-473N	RESISTOR
	R483	NRSA63J-102N	RESISTOR
	R484	NRSA63J-102N	RESISTOR
	R485	NRSA63J-102N	RESISTOR
	R486	NRSA63J-223N	RESISTOR
	R487	NRSA63J-223N	RESISTOR
	R488	NRSA63J-223N	RESISTOR
	R489	NRSA63J-223N	RESISTOR
	R490	NRSA63J-103N	RESISTOR
	R491	NRSA63J-103N	RESISTOR
	R492	NRSA63J-103N	RESISTOR
	R493	NRSA63J-103N	RESISTOR
	R494	NRSA63J-102N	RESISTOR
	R495	NRSA63J-101N	RESISTOR
	R497	NRSA63J-102N	RESISTOR
	R501	NRSA63J-102N	RESISTOR
	R502	NRSA63J-102N	RESISTOR
	R503	NRSA63J-473N	RESISTOR
	R504	NRSA63J-152N	RESISTOR
	R505	NRSA63J-332N	RESISTOR
	R506	NRSA63J-0R0A	RESISTOR
	R507	NRSA63J-0R0A	RESISTOR
	R512	NRSA63J-473N	RESISTOR
	R513	NRSA63J-102N	RESISTOR
	R514	NRSA63J-103N	RESISTOR
	R515	NRSA63J-303N	RESISTOR
	R516	NRSA63J-105N	RESISTOR
	R517	NRSA63J-225N	RESISTOR
	R519	NRSA63J-102N	RESISTOR
	R522	NRSA63J-273N	RESISTOR
	R523	NRSA63J-102N	RESISTOR
	RA101	YU40172-102NY	RESISTOR ARRAY
	RA102	YU40172-104NY	RESISTOR ARRAY
	RA103	YU40172-332NY	RESISTOR ARRAY

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	RA401	YU40172-102NY	RESISTOR ARRAY
	RA402	YU40172-102NY	RESISTOR ARRAY
	RA403	YU40172-102NY	RESISTOR ARRAY
	RA404	YU40172-102NY	RESISTOR ARRAY
	RA405	YU40172-102NY	RESISTOR ARRAY
	RA406	YU40172-102NY	RESISTOR ARRAY
	B101	NRSA63J-0R0A	RESISTOR
	C1	QEK41CM-476	E CAPACITOR
	C2	QEK41CM-476	E CAPACITOR
	C3	QED41CM-476	E CAPACITOR
	C4	QED41CM-476	E CAPACITOR
	C5	QED41AM-826	E CAPACITOR
	C6	QED41AM-826	E CAPACITOR
	C7	QED41AM-826	E CAPACITOR
	C8	QCY81EK-473ZL	CAPACITOR
	C9	QED41AM-826	E CAPACITOR
	C10	QCFA1EZ-104	CAPACITOR
	C15	QEF81EM-474	TANTAL CAPACITOR
	C101	QFZ0095-683	M CAPACITOR
	OR	QFZ9011-683	MM CAPACITOR
	C102	QFZ0095-124	M CAPACITOR
	OR	QFZ9011-124	MM CAPACITOR
	C103	QCYA1HK-392	CAPACITOR
	C104	NCT06CH-270A	CAPACITOR
	C105	NCT06CH-270A	CAPACITOR
	C106	QEF81AM-106	TANTAL CAPACITOR
	C107	QCYA1HK-103	CAPACITOR
	C108	QCYA1HK-562	CAPACITOR
	C109	QCYA1HK-103	CAPACITOR
	C110	QCSA1HJ-102	CAPACITOR
	C111	QEPA1CM-106	NP E CAPACITOR
	C112	QEPA1CM-106	NP E CAPACITOR
	C115	NCF31CZ-104A	CAPACITOR
	C116	NCB31EK-103A	CAPACITOR
	C121	QCYA1HK-222	CAPACITOR
	C122	QFZ0096-224	MM CAPACITOR
	C124	QCYA1EK-223	CAPACITOR
	C126	QCYA1EK-223	CAPACITOR
	C127	QCYA1EK-223	CAPACITOR
	C128	QCYA1HK-222	CAPACITOR
	C129	QFZ0095-104	MM CAPACITOR
	C130	QER41AM-106	E CAPACITOR
	C141	NCB31HK-102A	CAPACITOR
	C142	NCF31CZ-104A	CAPACITOR
	C143	NCT06CH-100A	CAPACITOR
	C144	NCF31CZ-104A	CAPACITOR
	C145	NCB31HK-471A	CAPACITOR
	C146	NCS31HJ-101A	CAPACITOR
	C147	NCB31HK-102A	CAPACITOR
	C148	QCFA1EZ-104	CAPACITOR
	C149	NCB31HK-562A	CAPACITOR
	C150	PU59758-105	CAPACITOR
	C151	PU59758-105	CAPACITOR
	C161	NCB31EK-103A	CAPACITOR
	C162	NCB31EK-103A	CAPACITOR
	C163	QCYA1EK-223	CAPACITOR
	C164	QCYA1EK-223	CAPACITOR
	C165	QCYA1EK-223	CAPACITOR
	C166	QER41AM-336	E CAPACITOR
	C167	QER41AM-336	E CAPACITOR
	C168	QER41AM-336	E CAPACITOR
	C175	QCYA1HK-103	CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C301	QEF81VM-224XB	TANTAL CAPACITOR
	C303	QER41CM-106	E CAPACITOR
	C304	QEF81VM-104XB	TANTAL CAPACITOR
	C306	QER40JM-336	E CAPACITOR
	C307	QER41AM-226	E CAPACITOR
	C308	QCYA1EK-223	CAPACITOR
	C309	QCYA1HK-681	CAPACITOR
	C310	QCYA1HK-272	CAPACITOR
	C311	QER41HM-474	E CAPACITOR
	C312	QER40JM-336	E CAPACITOR
	C313	QEPA0JM-226	NP E CAPACITOR
	C314	QER41HM-105	E CAPACITOR
	C315	QER41CM-106	E CAPACITOR
	C316	QER41CM-106	E CAPACITOR
	C318	QER40JM-226	E CAPACITOR
	C319	QFJ41HJ-682	M.P.F. CAP
	C320	QER41HM-474	E CAPACITOR
	C322	QCYA1HK-471	CAPACITOR
	C323	NCB31HK-222A	CAPACITOR
	C324	NCB31HK-222A	CAPACITOR
	C325	QFZ9011-473	MM CAPACITOR
	C326	QER41AM-476	E CAPACITOR
	C330	QCYA1HK-472	CAPACITOR
	C331	NCB31HK-182A	CAPACITOR
	C332	NCB31HK-472A	CAPACITOR
	C334	NCB31HK-682A	CAPACITOR
	C335	NCB31HK-472A	M CAPACITOR
	C336	NCB31HK-682A	CAPACITOR
	C401	QEF80JM-475	TANTAL CAPACITOR
	C402	NCS31HJ-330A	CAPACITOR
	C403	NCS31HJ-330A	CAPACITOR
	C404	QCFA1EZ-104	CAPACITOR
	C405	QEF80JM-475	TANTAL CAPACITOR
	C406	QCFA1EZ-104	CAPACITOR
	C407	QCFA1EZ-104	CAPACITOR
	C408	QCFA1EZ-333	CAPACITOR
	C409	NCB31EK-103A	CAPACITOR
	C412	NCB31HK-102A	CAPACITOR
	L1	PU56181-470	COIL
	L2	PU59022-3	COIL, 22μ
	L302	PU56197-2	EQUALIZER
	L303	YU40209	OSC COIL
	L304	PU59188-221K	COIL
	L401	YU40248-470KY	COIL
⚠	CF401	PU55812	RESONATOR
⚠	X1	YU40404	CRYSTAL RESONATOR
⚠		OR YU40405	CRYSTAL RESONATOR
	DD1	YU40169-01-03	DC-DC CONVERTER
	CL1	YU40245-01	WIRE CLAMP
	CL2	YU40245-03	WIRE CLAMP
	CL3	YU40245-04	WIRE CLAMP
	HS1	YU40466	HEAT SINK
	SLD1	YQ40511	SHEET
	SLD2	YU40467	INSULATOR
	SCR1	YQ40578	SCREW
	TP1	PU56278	TEST PIN
	TP2	PU56278	TEST PIN

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	TP3	PU56278	TEST PIN
	TP4	PU54983	TEST PIN
	TP5	PU54983	TEST PIN
	TP101	PU56278	TEST POINT
	TP102	PU56278	TEST POINT
	TP103	PU56278	TEST POINT
	TP104	PU56278	TEST POINT
	TP105	PU56278	TEST POINT
	TP106	PU56278	TEST POINT
	TP107	PU56278	TEST POINT
	TP108	PU56278	TEST POINT
	TP109	PU56278	TEST POINT
	TP111	PU56278	TEST POINT
	TP302	PU56278	TEST POINT
	TP303	PU56278	TEST POINT
	TP304	PU56278	TEST POINT
	CN1	YU40101-12	CAP HOUSING,(BOARD TO BOARD)
	CN2	YU40108-6	FPC CONNECTOR
	CN3	YU40096-3	CAP HOUSING
	CN4	YU40096-2	CAP HOUSING
	CN5	YU40104-14	CAP HOUSING,(BOARD TO BOARD)
	CN6	YU40108-12	FPC CONNECTOR
	CN7	YU40096-6	CAP HOUSING
	CN8	YU40106-10	FPC CONNECTOR
	CN9	PU58655-6	CAP HOUSING
	CN10	YU40096-3	W/B CN.WFR R/A
	CN11	YU40103-18	B/B CN.WFR-D6.5
	CN12	YU40096-7	CAP HOUSING
	CN13	YU40096-4	CAP HOUSING
	CN14	YU40096-3	CAP HOUSING
	CN15	YU40096-9	CAP HOUSING
	CN16	YU40106-15	FPC CONNECTOR
	CN17	YU40102-20	CAP HOUSING,(BOARD TO BOARD)
	CN18	YU40102-10	CAP HOUSING,(BOARD TO BOARD)
	CN19	YU40102-8	CAP HOUSING,(BOARD TO BOARD)
⚠	CP1	ICP-F15	CIRCUIT PROTECTOR
⚠	CP2	ICP-F15	CIRCUIT PROTECTOR
⚠	CP3	ICP-F15	CIRCUIT PROTECTOR
⚠	CP4	ICP-F15	CIRCUIT PROTECTOR
⚠	CP5	ICP-F20	CIRCUIT PROTECTOR

-VOLUME BOARD ASSEMBLY-

	PWBA	YB30018C	VOLUME BOARD ASSY
	Q107	DTA124EU	TRANSISTOR
	R106	NVP1301-474N	V RESISTOR,LP CTL DELAY
	R107	NRSA63J-184N	RESISTOR
	R108	NVP1301-474N	V RESISTOR,PB SWITCHING POINT
	R109	NRSA63J-154N	RESISTOR
	R122	NRSA63J-564N	RESISTOR

– SHORT SENS BOARD ASSEMBLY –

	PWBA	YB20054A	SHORT SENS BOARD ASSY
	Q311	DTA144EU	TRANSISTOR
	R356	QRSA08J-103YN	RESISTOR

– BUFFER RC BOARD ASSEMBLY –

	PWBA	YB20049A	BUFFER RC BOARD ASSY
	R350	QRSA08K-4R7YN	RESISTOR
	C317	QCF81EZ-224	CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION

– H. TRAP BOARD ASSEMBLY –

	PWBA	YB20050B	H. TRAP BOARD ASSY
	IC302	NJM2904E	IC
	R351	QRSA08J-0R0Y	RESISTOR
	R352	QRSA08J-0R0Y	RESISTOR
	R353	QRSA08J-0R0Y	RESISTOR
	R354	QRSA08J-0R0Y	RESISTOR
	R355	QRSA08J-0R0Y	RESISTOR
	TRAP301	YU40488	TRAP

– SWC BOARD ASSEMBLY –

	PWBA	YB20059A	SWC BOARD ASSY
	C123	QCYA1HK-332	CAPACITOR
	C125	QCYA1EK-223	CAPACITOR

– PS-2 BOARD ASSEMBLY –

	PWBA	YB20060A	PS-2 BOARD ASSY
	Q132	DTC144EK	TRANSISTOR
	Q133	FMG2	TRANSISTOR
	Q134	FMG2	TRANSISTOR
	D111	DAN202K	DIODE
	OR	MA151WK	DIODE
	R226	QRSA08J-103YN	RESISTOR

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8. Y/C BOARD ASSEMBLY <02>

	PWBA	YB10005A-02	Y/C BOARD ASSY
	IC1	BA7600K	IC
	IC2	AN3212S	IC
	IC3	AN3323S	IC
	IC4	THE045A	IC
	OR	THE245A	IC
	IC5	AN6308S	IC
	IC6	AN3592S	IC
	IC7	TA7374P	IC
	IC8	MSM6989MS-K	IC
	IC9	M51648FP	IC
	IC10	AN8009	IC
	Q1	DTC144EU	TRANSISTOR
	Q2	2SA1576	TRANSISTOR
	Q3	DTC144EU	TRANSISTOR
	Q4	DTC144EU	TRANSISTOR
	Q5	DTC144EU	TRANSISTOR
	Q6	2SC4081	TRANSISTOR
	Q7	2SC4081	TRANSISTOR
	Q8	2SC4081	TRANSISTOR
	Q9	3SK179	FE TRANSISTOR
	Q10	2SC4081	TRANSISTOR
	Q11	2SC4081	TRANSISTOR
	Q12	2SC4081	TRANSISTOR
	Q13	2SC4081	TRANSISTOR
	Q14	2SC4081	TRANSISTOR
	Q15	2SC4081	TRANSISTOR
	Q16	2SC4081	TRANSISTOR
	Q17	2SC4081	TRANSISTOR
	Q18	2SC4081	TRANSISTOR
	Q19	2SC4081	TRANSISTOR
	Q20	2SC4081	TRANSISTOR
	Q21	2SC4081	TRANSISTOR
	Q22	2SC4081	TRANSISTOR
	Q23	2SA1576	TRANSISTOR
	Q24	2SC4081	TRANSISTOR
	Q25	2SC4081	TRANSISTOR
	Q26	2SB624-T1BBV4	TRANSISTOR
	OR	2SB624-T1BBV5	TRANSISTOR
	Q27	2SB624-T1BBV4	TRANSISTOR
	OR	2SB624-T1BBV5	TRANSISTOR
	Q28	FMW1	TRANSISTOR
	Q29	DTC144EU	TRANSISTOR
	Q30	DTC144EU	TRANSISTOR
	Q31	2SC4081	TRANSISTOR
	Q32	2SB624-T1BBV4	TRANSISTOR
	OR	2SB624-T1BBV5	TRANSISTOR
	Q33	DTC144EU	TRANSISTOR
	Q34	DTC144EU	TRANSISTOR
	Q35	2SA1576	TRANSISTOR
	Q36	DTC144EU	TRANSISTOR
	Q37	2SB624-T1BBV4	TRANSISTOR
	OR	2SB624-T1BBV5	TRANSISTOR
	D1	DAN202U	DIODE
	D2	DAN202U	DIODE
	D3	DAN202U	DIODE
	D4	DAN202U	DIODE
	D5	DAN202U	DIODE
	D6	DAP202U	DIODE
	D12	DAN202U	DIODE
	D13	DAN202U	DIODE
	D14	DA204U	DIODE
	D19	DAN202U	DIODE
	D20	DA204U	DIODE
	R1	NVP1301-332N	V RESISTOR, VIDEO EQ (LP)
	R2	NRSA63J-152N	RESISTOR
	R3	NRSA63J-222N	RESISTOR
	R4	NRSA63J-152N	RESISTOR
	R5	QRSA08J-222YN	RESISTOR
	R6	NRSA63J-222N	RESISTOR
	R7	NRSA63J-222N	RESISTOR
	R8	NRSA63J-222N	RESISTOR
	R9	QRD161J-152	RESISTOR
	R11	NCS31HJ-180A	RESISTOR
	R13	QRSA08J-222YN	RESISTOR
	R14	NVP1301-332N	V RESISTOR, VIDEO EQ (SP)
	R15	NRSA63J-222N	RESISTOR
	R16	NRSA63J-681N	RESISTOR
	R17	NRSA63J-222N	RESISTOR
	R18	NRSA63J-182N	RESISTOR
	R20	NRSA63J-222N	RESISTOR
	R21	NRSA63J-0R0A	RESISTOR
	R24	NRSA63J-0R0A	RESISTOR
	R25	NRSA63J-821N	RESISTOR
	R26	NRSA63J-102N	RESISTOR
	R27	NRSA63J-102N	RESISTOR
	R28	NRSA63J-681N	RESISTOR
	R29	NRSA63J-331N	RESISTOR
	R30	NRSA63J-0R0A	RESISTOR
	R31	NRSA63J-182N	RESISTOR
	R32	NRSA63J-821N	RESISTOR
	R33	NRSA63J-332N	RESISTOR
	R34	NRSA63J-562N	RESISTOR
	R35	NRSA63J-562N	RESISTOR
	R36	NRSA63J-274N	RESISTOR
	R37	NRSA63J-152N	RESISTOR
	R38	NRSA63J-104N	RESISTOR
	R40	NRSA63J-682N	RESISTOR
	R42	NRSA63J-680N	RESISTOR
	R44	NRSA63J-682N	RESISTOR
	R45	NRSA63J-103N	RESISTOR
	R47	NRSA63J-222N	RESISTOR
	R49	NRSA63J-223N	RESISTOR
	R51	NRSA63J-393N	RESISTOR
	R52	NRSA63J-102N	RESISTOR
	R53	NRSA63J-223N	RESISTOR
	R54	NRSA63J-681N	RESISTOR
	R56	NRSA63J-472N	RESISTOR
	R57	NRSA63J-472N	RESISTOR
	R58	NRSA63J-823NY	RESISTOR
	R60	QRSA08J-155YN	RESISTOR
	R61	QRSA08J-153YN	RESISTOR
	R62	NRSA63J-471N	RESISTOR
	R63	NRSA63J-471N	RESISTOR
	R64	NRSA63J-102N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R65	NRSA63J-561N	RESISTOR
	R67	NRSA63J-822N	RESISTOR
	R68	NRSA63J-270N	RESISTOR
	R69	QRSA08J-101YN	RESISTOR
	R70	NRSA63J-122N	RESISTOR
	R71	NRSA63J-101N	RESISTOR
	R72	NRSA63J-122N	RESISTOR
	R73	QRSA08J-335YN	RESISTOR
	R74	NRSA63J-562N	RESISTOR
	R75	QRSA08J-564YN	RESISTOR
	R76	QRSA08J-225YN	RESISTOR
	R77	NRSA63J-152N	RESISTOR
	R78	NRSA63J-471N	RESISTOR
	R79	NRSA63J-152N	RESISTOR
	R80	NRSA63J-152N	RESISTOR
	R81	NRSA63J-152N	RESISTOR
	R82	NRSA63J-152N	RESISTOR
	R85	NRSA63J-0R0A	RESISTOR
	R86	NRSA63J-0R0A	RESISTOR
	R87	QRSA08J-0R0Y	RESISTOR
	R88	NRSA63J-0R0A	RESISTOR
	R89	NRSA63J-0R0A	RESISTOR
	R90	QRSA08J-0R0Y	RESISTOR
	R91	NRSA63J-0R0A	RESISTOR
	R92	NRSA63J-0R0A	RESISTOR
	R93	QRSA08J-0R0Y	RESISTOR
	R94	NRSA63J-0R0A	RESISTOR
	R95	NRSA63J-0R0A	RESISTOR
	R96	NRSA63J-0R0A	RESISTOR
	R97	NRSA63J-0R0A	RESISTOR
	R98	NRSA63J-0R0A	RESISTOR
	R99	NRSA63J-0R0A	RESISTOR
	R100	QRSA08J-0R0Y	RESISTOR
	R102	NRSA63J-102N	RESISTOR
	R105	NRSA63J-471N	RESISTOR
	R106	NRSA63J-103N	RESISTOR
	R107	NRSA63J-221N	RESISTOR
	R108	NRSA63J-821N	RESISTOR
	R109	NRSA63J-821N	RESISTOR
	R110	NRSA63J-102N	RESISTOR
	R111	NRSA63J-222N	RESISTOR
	R112	NRSA63J-103N	RESISTOR
	R113	NRSA63J-223N	RESISTOR
	R114	NRSA63J-223N	RESISTOR
	R115	NRSA63J-102N	RESISTOR
	R116	NRSA63J-223N	RESISTOR
	R117	NRSA63J-562N	RESISTOR
	R118	NRSA63J-472N	RESISTOR
	R119	NRSA63J-152N	RESISTOR
	R120	NRSA63J-152N	RESISTOR
	R121	NRSA63J-102N	RESISTOR
	R123	NRSA63J-122N	RESISTOR
	R124	NRSA63J-152N	RESISTOR
	R126	NRSA63J-103N	RESISTOR
	R127	NRSA63J-122N	RESISTOR
	R128	NRSA63J-683N	RESISTOR
	R129	NRSA63J-183N	RESISTOR
	R130	NRSA63J-333N	RESISTOR
	R131	NRSA63J-102N	RESISTOR
	R132	NRSA63J-223N	RESISTOR
	R133	NRSA63J-223N	RESISTOR
	R134	NRSA63J-681N	RESISTOR
	R135	NRSA63J-102N	RESISTOR
	R136	NRSA63J-0R0A	RESISTOR
	R137	NRSA63J-683N	RESISTOR
	R138	NRSA63J-0R0A	RESISTOR
	R139	NRSA63J-391N	RESISTOR
	R140	NRSA63J-0R0A	RESISTOR
	R141	NRSA63J-0R0A	RESISTOR
	R142	NRSA63J-0R0A	RESISTOR
	R143	NRSA63J-0R0A	RESISTOR
	R144	NRSA63J-0R0A	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R145	QRSA08J-0R0Y	RESISTOR
	R146	QRSA08J-0R0Y	RESISTOR
	R147	QRSA08J-0R0Y	RESISTOR
	R148	QRSA08J-0R0Y	RESISTOR
	R151	NRSA63J-102N	RESISTOR
	R154	NRSA63J-222N	RESISTOR
	R156	NRSA63J-272N	RESISTOR
	R157	NRSA63J-821N	RESISTOR
	R158	NRSA63J-473N	RESISTOR
	R159	NRSA63J-391N	RESISTOR
	R160	NRSA63J-123N	RESISTOR
	R161	NRSA63J-332N	RESISTOR
	R162	NRSA63J-333N	RESISTOR
	R163	NRSA63J-122N	RESISTOR
	R164	NRSA63J-333N	RESISTOR
	R165	NRSA63J-122N	RESISTOR
	R166	NRSA63J-333N	RESISTOR
	R167	NRSA63J-471N	RESISTOR
	R168	NRSA63J-152N	RESISTOR
	R169	NRSA63J-333N	RESISTOR
	R170	NRSA63J-223N	RESISTOR
	R171	NRSA63J-103N	RESISTOR
	R172	NRSA63J-154N	RESISTOR
	R173	NRSA63J-221N	RESISTOR
	R174	NRSA63J-393N	RESISTOR
	R176	NRSA63J-222N	RESISTOR
	R177	NRSA63J-561N	RESISTOR
	R178	NRSA63J-393N	RESISTOR
	R179	NRSA63J-561N	RESISTOR
	R180	NRSA63J-223N	RESISTOR
	R181	NRSA63J-473N	RESISTOR
	R182	NRSA63J-473N	RESISTOR
	R183	QRSA08J-562YN	RESISTOR
	R184	NRSA63J-681N	RESISTOR
	R185	NRSA63J-391N	RESISTOR
	R186	NRSA63J-681N	RESISTOR
	R187	NRSA63J-471N	RESISTOR
	R188	NRSA63J-681N	RESISTOR
	R189	NRSA63J-223N	RESISTOR
	R190	NRSA63J-103N	RESISTOR
	R191	NRSA63J-222N	RESISTOR
	R192	NRSA63J-393N	RESISTOR
	R193	NRSA63J-473N	RESISTOR
	R195	NRSA63J-103N	RESISTOR
	R196	NRSA63J-102N	RESISTOR
	R197	NRSA63J-122N	RESISTOR
	R198	NRSA63J-223N	RESISTOR
	R199	NRSA63J-561N	RESISTOR
	R200	NRSA63J-681N	RESISTOR
	R201	NRSA63J-471N	RESISTOR
	R202	NRSA63J-681N	RESISTOR
	R203	NRSA63J-561N	RESISTOR
	R204	NRSA63J-272N	RESISTOR
	R205	NRSA63J-471N	RESISTOR
	R206	NRSA63J-104N	RESISTOR
	R209	NRSA63J-153N	RESISTOR
	R210	NRSA63J-0R0A	RESISTOR
	R211	NRSA63J-0R0A	RESISTOR
	R212	NRSA63J-0R0A	RESISTOR
	R213	QRSA08J-0R0Y	RESISTOR
	R214	QRSA08J-0R0Y	RESISTOR
	R215	QRSA08J-0R0Y	RESISTOR
	R216	QRSA08J-0R0Y	RESISTOR
	R217	QRSA08J-0R0Y	RESISTOR
	R220	NRSA63J-0R0A	RESISTOR
	R221	NRSA63J-472N	RESISTOR
	R222	NRSA63J-472N	RESISTOR
	R223	NRSA63J-472N	RESISTOR
	R224	NRSA63J-472N	RESISTOR
	R226	NRSA63J-223N	RESISTOR
	R228	NRSA63J-563N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R229	NRSA63J-103N	RESISTOR
	R230	NRSA63J-103N	RESISTOR
	R232	NRSA63J-102N	RESISTOR
	R233	NRSA63J-562N	RESISTOR
	R234	NRSA63J-562N	RESISTOR
	R235	NRSA63J-0R0A	RESISTOR
	R236	NRSA63J-152N	RESISTOR
	R237	NRSA63J-681N	RESISTOR
	R238	NRSA63J-182N	RESISTOR
	R240	NRSA63J-102N	RESISTOR
	R243	NRSA63J-0R0A	RESISTOR
	R244	QRSA08J-0R0Y	RESISTOR
	R245	NRSA63J-0R0A	RESISTOR
	R246	NRSA63J-0R0A	RESISTOR
	R247	NRSA63J-0R0A	RESISTOR
	R248	NRSA63J-0R0A	RESISTOR
	R249	NRSA63J-0R0A	RESISTOR
	R250	QRSA08J-0R0Y	RESISTOR
	R251	QRSA08J-0R0Y	RESISTOR
	R252	QRSA08J-0R0Y	RESISTOR
	R253	NRSA63J-0R0A	RESISTOR
	R254	NRSA63J-0R0A	RESISTOR
	R258	QRSA08J-0R0Y	RESISTOR
	R259	QRSA08J-0R0Y	RESISTOR
	R261	QRSA08J-0R0Y	RESISTOR
	R262	QRSA08J-0R0Y	RESISTOR
	R263	QRSA08J-0R0Y	RESISTOR
	R264	QRSA08J-0R0Y	RESISTOR
	R265	NRSA63J-0R0A	RESISTOR
	R266	NRSA63J-563N	RESISTOR
	R267	NRSA63J-564N	RESISTOR
	R268	NRSA63J-105N	RESISTOR
	R269	NRSA63J-104N	RESISTOR
	R281	NRSA63J-0R0A	RESISTOR
	R282	NRSA63J-821N	RESISTOR
	R283	NRSA63J-103N	RESISTOR
	R284	NRSA63J-103N	RESISTOR
	R285	NRSA63J-333N	RESISTOR
	R286	NRSA63J-333N	RESISTOR
	R289	NRSA63J-0R0A	RESISTOR
	R290	NRSA63J-0R0A	RESISTOR
	R291	QRSA08J-0R0Y	RESISTOR
	R292	NRSA63J-0R0A	RESISTOR
	R293	NRSA63J-0R0A	RESISTOR
	R295	NRSA63J-0R0A	RESISTOR
	R296	QRSA08J-0R0Y	RESISTOR
	R297	NRSA63J-0R0A	RESISTOR
	R298	NRSA63J-0R0A	RESISTOR
	R299	QRSA08J-0R0Y	RESISTOR
	R305	NVP1301-102N	V RESISTOR, CAMERA EE LEVEL
	R309	NVP1301-473N	V RESISTOR, PB DEM LEVEL
	R312	NVP1301-473N	V RESISTOR, WHITE CLIP
	R313	NVP1301-473N	V RESISTOR, DARK CLIP
	R314	NVP1301-473N	V RESISTOR, EE Y LEVEL
	R318	NVP1301-473N	V RESISTOR, AFC
	R319	NVP1301-102N	V RESISTOR, PB INPUT COL LEVEL
	R320	NVP1301-681N	V RESISTOR, REC COL LEVEL (LP)
	R321	NVP1301-681N	V RESISTOR, REC COL LEVEL (SP)
	R322	NVP1301-222N	V RESISTOR, PB COL LEVEL (LP)
	R323	NVP1301-102N	V RESISTOR, CAMERA EE COL LEVEL
	R327	NVP1301-222N	V RESISTOR, REC FM LEVEL (SP)
	R331	NVP1301-153N	V RESISTOR,CARRIER
	R332	NVP1301-103N	V RESISTOR, DEVIATION
	R351	NVP1301-473N	V RESISTOR, 0.5H JUMP DET
	R352	NVP1301-103N	V RESISTOR, 0.5H VIDEO
	R353	NVP1301-222N	V RESISTOR, 0.5H DELAY COL LEVEL

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R381	NVP1301-222N	V RESISTOR, VIDEO NOISE CANCEL
	R382	NVP1301-222N	V RESISTOR, REC FM LEVEL (LP)
	R383	NVP1301-472N	V RESISTOR, PB COL LEVEL (SP)
	R384	NVP1301-102N	V RESISTOR, PB Y LEVEL
	R401	NRSA63J-222N	RESISTOR
	R402	NRSA63J-152N	RESISTOR
	R403	NRSA63J-153N	RESISTOR
	R404	NRSA63J-123N	RESISTOR
	R405	NRSA63J-333N	RESISTOR
	R406	NRSA63J-472N	RESISTOR
	R407	NRSA63J-473N	RESISTOR
	R408	NRSA63J-103N	RESISTOR
	R409	NRSA63J-102N	RESISTOR
	R411	NRSA63J-101N	RESISTOR
	R421	NRSA63J-104N	RESISTOR
	C2	NCS31HJ-680A	CAPACITOR
	C3	NCS31HJ-150A	CAPACITOR
	C4	NCB31EK-103A	CAPACITOR
	C5	NCB31EK-103A	CAPACITOR
	C6	NCS31HJ-680A	CAPACITOR
	C7	NCS31HJ-100A	CAPACITOR
	C8	QCS11HJ-150	CAPACITOR
	C9	NCB31EK-103A	CAPACITOR
	C10	NCB31EK-103A	CAPACITOR
	C11	NCB31EK-103A	CAPACITOR
	C12	NCB31EK-103A	CAPACITOR
	C13	NCB31EK-103A	CAPACITOR
	C14	NRSA63J-122N	CAPACITOR
	C15	NCS31HJ-680A	CAPACITOR
	C16	NCS31HJ-150A	CAPACITOR
	C17	NCB31EK-103A	CAPACITOR
	C18	NCB31EK-103A	CAPACITOR
	C19	NCS31HJ-390A	CAPACITOR
	C21	NRSA63J-0R0A	RESISTOR
	C22	NCB31EK-103A	CAPACITOR
	C23	NCB31EK-103A	CAPACITOR
	C24	NCB31EK-103A	CAPACITOR
	C25	NCB31EK-103A	CAPACITOR
	C26	NRSA63J-0R0A	RESISTOR
	C27	NCB31EK-103A	CAPACITOR
	C28	NCS31HJ-270A	CAPACITOR
	C29	NCB31EK-103A	CAPACITOR
	C30	QCSA1HJ-821	CAPACITOR
	C31	NCS31HJ-820A	CAPACITOR
	C32	NCS31HJ-390A	CAPACITOR
	C33	QCYA1HK-103	CAPACITOR
	C34	ECEV0JV220R	E CAPACITOR
	C35	NCB31EK-103A	CAPACITOR
	C36	ECEV0JV220R	E CAPACITOR
	C37	NCB31EK-103A	CAPACITOR
	C38	NCS31HJ-8R0A	CAPACITOR
	C39	NCS31HJ-8R0A	CAPACITOR
	C41	QEF80JM-476	TANTAL CAPACITOR
	C42	QCYA1EK-223	CAPACITOR
	C43	NCS31HJ-151A	CAPACITOR
	C44	NCB31HK-471A	CAPACITOR
	C45	NCB31HK-391A	CAPACITOR
	C46	NCS31HJ-181A	CAPACITOR
	C47	ECEV1HV2R2R	E CAPACITOR
	C48	NCS31HJ-151A	CAPACITOR
	C49	NCS31HJ-5R0A	CAPACITOR
	C50	NCT06CH-390A	CAPACITOR
	C51	NCB31EK-103A	CAPACITOR
	C53	QEF80JM-225	TANTAL CAPACITOR
	C54	NCB31HK-222A	CAPACITOR
	C55	NCB31EK-103A	CAPACITOR
	C56	ECEV1EV4R7R	E CAPACITOR
	C57	ECEV1EV4R7R	E CAPACITOR
	C58	ECEV1HV2R2R	E CAPACITOR
	C59	ECEV1HV3R3R	E CAPACITOR
	C60	NCB31EK-103A	CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C61	NCS31HJ-680A	CAPACITOR
	C62	QEF81AM-105	E CAPACITOR
	C64	NCB31EK-103A	CAPACITOR
	C65	QCYA1EK-223	CAPACITOR
	C66	QEE81AM-476	E CAPACITOR
	C67	QCYA1EK-223	CAPACITOR
	C68	NCB31EK-103A	CAPACITOR
	C69	NCB31EK-103A	CAPACITOR
	C70	NCB31EK-103A	CAPACITOR
	C71	NCS31HJ-120A	CAPACITOR
	C72	NCB31EK-103A	CAPACITOR
	C73	NCB31EK-103A	CAPACITOR
	C74	NCS31HJ-390A	CAPACITOR
	C75	NCB31EK-103A	CAPACITOR
	C76	NCS31HJ-270A	CAPACITOR
	C77	NCB31EK-103A	CAPACITOR
	C78	QCFA1EZ-473	CAPACITOR
	C79	NCB31EK-103A	CAPACITOR
	C80	QCSA1HJ-122	CAPACITOR
	C81	QCSA1HJ-122	CAPACITOR
	C82	NCS31HJ-151A	CAPACITOR
	C83	NCB31HK-681A	CAPACITOR
	C84	NCS31HJ-330A	CAPACITOR
	C86	QEF81AM-105	TANTAL CAPACITOR
	C87	NCT06CH-270A	CAPACITOR
	C88	NCT06CH-270A	CAPACITOR
	C89	QCTA1CH-270	CAPACITOR
	C90	QEF81AM-105	TANTAL CAPACITOR
	C91	QEF81AM-105	TANTAL CAPACITOR
	C101	NCB31EK-103A	CAPACITOR
	C102	NCS31HJ-330A	CAPACITOR
	C103	NCB31EK-103A	CAPACITOR
	C104	NRSA63J-0R0A	RESISTOR
	C105	NCB31EK-103A	CAPACITOR
	C107	NCB31EK-103A	CAPACITOR
	C108	NCB31EK-103A	CAPACITOR
	C109	NCB31EK-103A	CAPACITOR
	C110	NCB31EK-103A	CAPACITOR
	C111	NCB31EK-103A	CAPACITOR
	C112	NCB31EK-103A	CAPACITOR
	C113	NCB31EK-103A	CAPACITOR
	C114	NCT06CH-390A	CAPACITOR
	C115	NCB31EK-103A	CAPACITOR
	C116	NCB31EK-103A	CAPACITOR
	C117	NCB31EK-103A	CAPACITOR
	C118	NCB31EK-103A	CAPACITOR
	C119	NCB31EK-103A	CAPACITOR
	C120	NCB31EK-103A	CAPACITOR
	C121	QEF81AM-105	TANTAL CAPACITOR
	C152	NCB31EK-103A	CAPACITOR
	C153	NCS31HJ-220A	CAPACITOR
	C154	NCS31HJ-220A	CAPACITOR
	C155	NCB31EK-103A	CAPACITOR
	C156	QEF81AM-105	TANTAL CAPACITOR
	C157	QEF81AM-105	TANTAL CAPACITOR
	C158	QEF81AM-475	TANTAL CAPACITOR
	C159	NCB31HK-152A	CAPACITOR
	C160	NCB31HK-332A	CAPACITOR
	C161	QEF81AM-105	TANTAL CAPACITOR
	C162	NCB31EK-103A	CAPACITOR
	C163	NCS31HJ-151A	CAPACITOR
	C164	NCB31EK-103A	CAPACITOR
	C165	NCB31EK-103A	CAPACITOR
	C166	NCB31EK-103A	CAPACITOR
	C167	QEF81AM-105	TANTAL CAPACITOR
	C168	QFN41HJ-222	CAPACITOR
	C169	NCB31EK-103A	CAPACITOR
	C170	NCB31EK-103A	CAPACITOR
	C171	NCB31HK-222A	CAPACITOR
	C172	ECEV0JV220R	E CAPACITOR
	C173	NCB31EK-103A	CAPACITOR
	C174	NCB31EK-103A	CAPACITOR
	C175	QCYA1EK-223	CAPACITOR
	C176	QEF81AM-105	TANTAL CAPACITOR
	C177	NCB31EK-103A	CAPACITOR
	C178	NCB31EK-103A	CAPACITOR
	C179	QCTA1CH-100	CAPACITOR
	C180	NCB31EK-103A	CAPACITOR
	C181	QER40JM-476	E CAPACITOR
	C182	QCYA1EK-223	CAPACITOR
	C183	ECEV1EV4R7R	E CAPACITOR
	C184	NCB31HK-102A	CAPACITOR
	C185	NCB31EK-103A	CAPACITOR
	C186	NCB31EK-103A	CAPACITOR
	C187	QEF81AM-475	TANTAL CAPACITOR
	C188	NCF31CZ-104A	CAPACITOR
	C189	NCB31EK-103A	CAPACITOR
	C190	QEF80GM-106	TANTAL CAPACITOR
	C191	NCS31HJ-330A	CAPACITOR
	C192	NCS31HJ-270A	CAPACITOR
	C193	QER40JM-476	E CAPACITOR
	C194	NCS31HJ-220A	CAPACITOR
	C195	NCB31EK-103A	CAPACITOR
	C196	QEK41AM-107	E CAPACITOR
	C197	NCB31EK-103A	CAPACITOR
	C202	PU56274B-200	TRIMMER CAPACITOR, VCO
	C222	QEF81AM-106	TANTAL CAPACITOR
	C223	ECEV0JV220R	E CAPACITOR
	C224	NCB31EK-103A	CAPACITOR
	C225	QEF81AM-105	E CAPACITOR
	C226	QEF81AM-105	TANTAL CAPACITOR
	C227	NCB31EK-103A	CAPACITOR
	C228	NCB31EK-103A	CAPACITOR
	C229	QCYA1EK-223	CAPACITOR
	C230	QCYA1EK-223	CAPACITOR
	C231	QCYA1EK-223	CAPACITOR
	C232	QEK41AM-107	E CAPACITOR
	C233	NCB31EK-103A	CAPACITOR
	C234	ECEV1CV100R	E CAPACITOR
	C235	ECEV1EV4R7R	E CAPACITOR
	C236	QCYA1EK-223	CAPACITOR
	C237	QEKA0HM-477	E CAPACITOR
	C238	QEKA0HM-477	E CAPACITOR
	C239	ECEV1HV010R	E CAPACITOR
	C240	ECEV1HV010R	E CAPACITOR
	C242	NCS31HJ-680A	CAPACITOR
	C243	QEF81AM-105	TANTAL CAPACITOR
	C244	QEF81AM-105	TANTAL CAPACITOR
	C245	NCS31HJ-820A	CAPACITOR
	C247	ECEV1HV010R	E CAPACITOR
	C248	ECEV1HV010R	E CAPACITOR
	C401	NCS31HJ-820A	CAPACITOR
	C403	QCYA1HK-333	CAPACITOR
	C404	QCYA1HK-333	CAPACITOR
	C406	NCS31HJ-220A	CAPACITOR
	C421	NCS31HJ-270A	CAPACITOR
	C422	NCS31HJ-5R0A	CAPACITOR
	C423	NCS31HJ-5R0A	CAPACITOR
	C424	NCS31HJ-5R0A	CAPACITOR
	C425	NCS31HJ-5R0A	CAPACITOR
	C426	QCS11HJ-390	CAPACITOR
	C427	QEE81AM-476	CAPACITOR
	C428	QCS11HJ-120	CAPACITOR
	L1	YU40249-560JY	COIL
		OR PU58201-560JY	COIL
	L2	YU40249-220JY	COIL
		OR PU58201-220JY	COIL
	L3	YU40249-330JY	COIL
		OR PU58201-330J	COIL
	L4	YU40249-470JY	COIL
		OR PU58201-470J	COIL
	L5	PU59152-101J	COIL

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	L6	YU40249-820JY	COIL
	L7	YU40249-560JY	COIL
		OR PU58201-560J	COIL
	L8	YU40249-270JY	COIL
		OR PU58201-270J	COIL
	L9	YU40249-330JY	COIL
		OR PU58201-330J	COIL
	L11	YU40249-220JY	COIL
		OR PU58201-220J	COIL
	L12	YU40249-820JY	COIL
		OR PU58201-820J	COIL
	L13	QRS188J-0R0Y	COIL
	L15	YU40249-120JY	COIL
		OR PU58201-120J	COIL
	L16	YU40248-470KY	COIL
	L17	YU40248-470KY	COIL
	L18	YU40248-470KY	COIL
	L19	YU40249-121KY	COIL
		OR PU58201-121K	COIL
	L20	YU40249-121KY	COIL
		OR PU58201-121K	COIL
	L21	YU40249-120JY	COIL
		OR PU58201-120J	COIL
	L22	YU40249-120JY	COIL
		OR PU58201-120J	COIL
	L23	YU40248-470KY	COIL
	L31	YU40249-220JY	COIL
		OR PU58201-220J	COIL
	L32	YU40249-470JY	COIL
		OR PU58201-470J	COIL
	L33	YU40248-470KY	COIL
	L34	PU59031	FH TRAP COIL
	L35	YU40248-470KY	COIL
	L41	YU40249-330JY	COIL
		OR PU58201-330J	COIL
	L42	PU59482-2	LC BLOCK
	L43	YU40249-100JY	COIL
		OR PU58201-100J	COIL
	L44	YU40248-470KY	COIL
	L45	PU59483	LC BLOCK
	L46	YU40248-470KY	COIL
	L48	YU40249-560JY	COIL
		OR PU58201-560J	COIL
	L49	YU40249-390JY	COIL
		OR PU58201-390J	COIL
	L50	YU40248-470KY	COIL
	L51	YU40248-470KY	COIL
	L52	YU40248-470KY	COIL
	L54	YU40249-330JY	COIL
		OR PU58201-330J	COIL
	L55	QRSA08J-0R0Y	RESISTOR
	L60	QRS188J-0R0Y	RESISTOR
	L401	YU40249-560JY	COIL
		OR PU58201-560J	COIL
	L403	YU57620-331K	COIL
		OR PU55843-331K	COIL
	L404	PU57620-102K	COIL
		OR PU55843-102K	COIL
	L406	YU40249-560JY	COIL
		OR PU58201-560J	COIL
	L407	PU59152-330	COIL
	L408	PU59152-820J	COIL
	EQ1	PU59480-3	EQUALIZER
	EQ2	PU59857	EQUALIZER
		OR PU59857-Z	EQUALIZER
	LPF1	PU59474-3	LOW PASS FILTER
	LPF2	PU59475-2	LOW PASS FILTER
	LPF3	PU59476-2	LOW PASS FILTER
	BPF1	PU59477	BAND PASS FILTER
	BPF2	PU59478	BAND PASS FILTER
	HPF1	YU40481	HIGH PASS FILTER

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	DL1	PU59472	DELAY LINE
	DL2	YU40459	COMB FILTER
⚠	X1	PU31449-2	CRYSTAL RESONATOR
	CL1	YU40245-02	WIRE CLAMP
	TP6	PU56278	TEST POINT
	TP7	PU56278	TEST POINT
	TP8	PU56278	TEST POINT
	TP9	PU56278	TEST POINT
	TP10	PU56278	TEST POINT
	TP11	PU56278	TEST POINT
	TP13	PU56278	TEST POINT
	TP14	PU56278	TEST POINT
	TP15	PU56278	TEST POINT
	TP16	PU56278	TEST POINT
	TP19	PU56278	TEST POINT
	TP20	PU56278	TEST POINT
	TP31	PU56278	TEST POINT
	TP41	PU56278	TEST POINT
	TP42	PU56278	TEST POINT
	TP51	PU56278	TEST POINT
	TP52	PU56278	TEST POINT
	TP53	PU56278	TEST POINT
	TP54	PU56278	TEST POINT
	TP55	PU56278	TEST POINT
	TP56	PU56278	TEST POINT
	TP57	PU56278	TEST POINT
	TP58	PU56278	TEST POINT
	CN1	YU40105-20	B/B HOUSING-DS
	CN2	YU40105-10	B/B HOUSING-DS
	CN3	YU40105-8	B/B HOUSING-DS
	CN4	YU40096-2	W/B CN.WFR R/A
	CN5	YU40096-2	W/B CN.WFR R/A

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9. D.MDA BOARD ASSEMBLY <03>

PWBA	YB20021A-01-C	DRUM MDA BOARD ASSY
IC251	BA6452F	IC
D251	MA141WA	DIODE
R251	NRSA63J-102N	RESISTOR
R252	NRSA63J-104N	RESISTOR
R253	NRSA63J-153N	RESISTOR
R254	NRSA63J-222N	RESISTOR
R255	NRSA63J-101N	RESISTOR
R256	NRSA63K-2R2N	RESISTOR
R257	NRSA63K-2R2N	RESISTOR
R258	NRSA63K-2R2N	RESISTOR
R259	QRG125J-R68AR	MF RESISTOR
R260	NRSA63J-104N	RESISTOR
R261	NRSA63J-0R0A	RESISTOR
C251	QCY81EK-104	CAPACITOR
C252	NCB31HK-471A	CAPACITOR
C253	QCY81CK-224	CAPACITOR
C254	QCFA1EZ-104	CAPACITOR
C255	QER41CM-106ZE	E CAPACITOR
C256	QCYA1EK-223	CAPACITOR
C257	QER41CM-106ZE	E CAPACITOR
C258	QER41CM-106ZE	E CAPACITOR
C259	QER41CM-106ZE	E CAPACITOR
C260	QCY81EK-104	CAPACITOR
C261	QER41CM-106ZE	E CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	SW251	YU40177	CASSETTE LOCK SW
	CN251	YU40096-2R	CAP HOUSING
	CN252	YU40107-16	FPC CONNECTOR
	CN253	YU40096-2Y	CAP HOUSING
	CN254	YU40105-14	CAP HOUSING,(BOARD TO BOARD)

10. MIC JACK BOARD ASSEMBLY <05>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20026C1	MIC JACK BOARD ASSY
	CN1	YU40096-3	CAP HOUSING

11. JACK BOARD ASSEMBLY <06>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20026B2	JACK BOARD ASSY
	D1	RD5.6EB2	ZENER DIODE
	R3	QRD161J-750	RESISTOR
	R4	QRD161J-750	RESISTOR
	R5	QRD161J-101	RESISTOR
	R6	QRD161J-102	RESISTOR
	FW1	YU40206	FLAT WIRE1
	FW2	YU40207	FLAT WIRE2

12. TRIGGER BOARD ASSEMBLY <07>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20026D3	TRIGGER BOARD ASSY
	D1	ERA81-004	DIODE
	R1	QRD161J-683	RESISTOR
	SW1	PU59843	TRIGGER SW
	SW2	YU40171	SWITCH(SLIDE)
	SPC1	YQ40478	SPACER
	WR1	YU40417	LUG WIRE ASS'Y
	CN1	YU40096-3	CAP HOUSING
	CN2	YU40096-4	CAP HOUSING
	CN3	YU40096-2	CAP HOUSING
⚠	F1	QMF51E2-3R15	FUSE, NOT INCL. TRIGGER BOARD
⚠	F CLIP	YU40170	FUSE CLIP,X2

13. RELAY DRIVE BOARD ASSEMBLY <15>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20038A	RELAY DRIVE BOARD ASSY
	IC1	BU4011BF	IC
	IC2	UPD4538BG	IC
	IC3	S8054HN-CB	IC
	R1	NRSA63J-104N	RESISTOR
	R2	NRSA63J-224N	RESISTOR
	R3	NRSA63J-104N	RESISTOR
	R4	NRSA63J-103N	RESISTOR
	C1	QCF81EZ-224ZL	CAPACITOR
	C2	QCFA1EZ-104	CAPACITOR
	C3	QCFA1EZ-104	CAPACITOR
	C4	QCF81CZ-105	CAPACITOR
		OR PU59758-105	CAPACITOR
	HD1	YQ40552	HOLDER(R.D.PWB)
	SCW1	SPSH1720M	SCREW
	CN1	YU40096-3	W/B CN.WFR R/A
	CN2	YU40096-4	W/B CN.WFR R/A

14. VIDEO-1 BOARD ASSEMBLY <21>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20016L-C	VIDEO-1 BOARD ASSY
	IC2	CP1088G	IC
	IC3	MC8089A	IC
	IC4	UPC2370GH	IC
	IC5	MSM6831	IC
	IC9	THE175A	IC
	Q1	2SA1576(QR)	TRANSISTOR
		OR 2SA1532(BC)	TRANSISTOR
	Q2	2SD1819(RS)	TRANSISTOR
	Q3	2SC4098(PQ)	TRANSISTOR
		OR 2SC3936(BC)	TRANSISTOR
	Q4	2SB1218(RS)	TRANSISTOR
	Q8	2SD1819(RS)	TRANSISTOR
	Q12	2SA1576(QR)	TRANSISTOR
		OR 2SA1532(BC)	TRANSISTOR
	Q13	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q14	2SA1576(QR)	TRANSISTOR
		OR 2SA1532(BC)	TRANSISTOR
	Q15	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q16	2SA1576(QR)	TRANSISTOR
		OR 2SA1532(BC)	TRANSISTOR
	Q17	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q18	2SC4098(PQ)	TRANSISTOR
		OR 2SC3936(BC)	TRANSISTOR
	Q29	2SA1576(QR)	TRANSISTOR
		OR 2SA1532(BC)	TRANSISTOR
	Q30	2SC3936(BC)	TRANSISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
		OR 2SC4098(PQ)	TRANSISTOR
	Q31	2SC4098(PQ)	TRANSISTOR
		OR 2SC3936(BC)	TRANSISTOR
	Q32	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q33	2SC3931(CD)	TRANSISTOR
	Q34	2SA1576(QR)	TRANSISTOR
		OR 2SA1532(BC)	TRANSISTOR
	Q35	2SA1532(BC)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q40	2SC4098(PQ)	TRANSISTOR
		OR 2SC3936(BC)	TRANSISTOR
	D1	MA143	DIODE
	D2	MA141WA	DIODE
	R2	NRSA63J-152N	RESISTOR
	R3	NRSA63J-331N	RESISTOR
	R4	NRSA63J-152N	RESISTOR
	R5	NRSA63J-105N	RESISTOR
	R6	NRSA63J-122N	RESISTOR
	R7	NRSA63J-102N	RESISTOR
	R8	NRSA63J-103N	RESISTOR
	R9	NRSA63J-102N	RESISTOR
	R10	NRSA63J-102N	RESISTOR
	R11	NRSA63J-393N	RESISTOR
	R12	NRSA63J-683N	RESISTOR
	R14	NRSA63J-0R0A	RESISTOR
	R15	NRSA63J-0R0A	RESISTOR
	R16	NRSA63J-203N	RESISTOR
	R17	NRSA63J-821N	RESISTOR
	R21	NRSA63J-303N	RESISTOR
	R22	NRSA63J-303N	RESISTOR
	R23	NRSA63J-332N	RESISTOR
	R24	NRSA63J-220N	RESISTOR
	R25	NRSA63J-104N	RESISTOR
	R26	NRSA63J-472N	RESISTOR
	R27	NRSA63J-183N	RESISTOR
	R28	NRSA63J-912N	RESISTOR
	R29	NVP1301-104N	V RESISTOR, BLOOMING
	R30	NRSA63J-104N	RESISTOR
	R33	NRSA63J-184N	RESISTOR
	R36	NRSA63J-152N	RESISTOR
	R40	NRSA63J-473N	RESISTOR
	R41	NVP1301-223N	V RESISTOR,AGC
	R42	NRSA63J-223N	RESISTOR
	R43	NRSA63J-333N	RESISTOR
	R44	NRSA63J-123N	RESISTOR
	R45	NRSA63J-103N	RESISTOR
	R46	NRSA63J-473N	RESISTOR
	R47	NRSA63J-333N	RESISTOR
	R48	NRSA63J-102N	RESISTOR
	R49	NVP1301-103N	V RESISTOR,B SEPA
	R50	NRSA63J-102N	RESISTOR
	R52	NVP1301-103N	V RESISTOR,R SEPA
	R54	NVP1301-103N	V RESISTOR,R LEVEL
	R55	NRSA63J-102N	RESISTOR
	R56	NVP1301-103N	V RESISTOR,B LEVEL
	R57	NRSA63J-102N	RESISTOR
	R58	NVP1301-103N	V RESISTOR,YL LEVEL
	R60	NRSA63J-562N	RESISTOR
	R61	NRSA63J-222N	RESISTOR
	R62	NRSA63J-102N	RESISTOR
	R63	NRSA63J-102N	RESISTOR
	R64	NRSA63J-102N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R65	NRSA63J-102N	RESISTOR
	R66	NVP1301-103N	V RESISTOR,YH SET UP
	R67	NVP1301-103N	V RESISTOR,YL SET UP
	R68	NVP1301-103N	V RESISTOR,R SET UP
	R69	NRSA63J-183N	RESISTOR
	R70	NRSA63J-243N	RESISTOR
	R71	NRSA63G-273N	RESISTOR
	R72	NRSA63G-393N	RESISTOR
	R73	NRSA63J-103N	RESISTOR
	R74	NRSA63J-123N	RESISTOR
	R75	NRSA63J-332N	RESISTOR
	R76	NRSA63J-102N	RESISTOR
	R77	NRSA63J-102N	RESISTOR
	R78	NRSA63J-562N	RESISTOR
	R79	NRSA63J-103N	RESISTOR
	R80	NRSA63J-102N	RESISTOR
	R81	NRSA63J-102N	RESISTOR
	R83	NVP1301-102N	V RESISTOR,YH BALANCE
	R84	NRSA63J-102N	RESISTOR
	R86	NRSA63J-103N	RESISTOR
	R87	NRSA63J-103N	RESISTOR
	R90	NRSA63J-105N	RESISTOR
	R101	NRSA63J-0R0A	RESISTOR
	R102	NRSA63J-0R0A	RESISTOR
	R103	NRSA63J-0R0A	RESISTOR
	R107	NRSA63J-102N	RESISTOR
	R108	NRSA63J-102N	RESISTOR
	R109	NRSA63J-332N	RESISTOR
	R110	NVP1301-103N	V RESISTOR,B SET UP
	R111	NRSA63J-102N	RESISTOR
	R116	NRSA63J-472N	RESISTOR
	R117	NRSA63J-102N	RESISTOR
	R118	NRSA63J-102N	RESISTOR
	R119	NVP1301-103N	V RESISTOR,V EDGE 2H
	R120	NRSA63J-681N	RESISTOR
	R121	NRSA63J-102N	RESISTOR
	R122	NRSA63J-102N	RESISTOR
	R123	NVP1301-222N	V RESISTOR,V EDGE 1H
	R124	NRSA63J-102N	RESISTOR
	R125	NRSA63J-751N	RESISTOR
	R126	NRSA63J-222N	RESISTOR
	R127	NRSA63J-122N	RESISTOR
	R128	NRSA63J-271N	RESISTOR
	R129	NRSA63J-222N	RESISTOR
	R141	NRSA63J-105N	RESISTOR
	R143	NRSA63J-102N	RESISTOR
	R144	NVP1301-103N	V RESISTOR,B-Y GAIN
	R145	NRSA63J-102N	RESISTOR
	R146	NRSA63J-102N	RESISTOR
	R147	NVP1301-103N	V RESISTOR,YH GAIN
	R148	NRSA63J-102N	RESISTOR
	R149	NRSA63J-102N	RESISTOR
	R150	NRSA63J-0R0A	RESISTOR
	C1	NCT07CH-220A	CAPACITOR
	C2	NCT07CH-220A	CAPACITOR
	C3	NCB31EK-103A	CAPACITOR
	C4	ECEV0JV220R	E CAPACITOR
	C5	PU56247B-200	TRIMMER CAPACITOR,CLOCK OSC
		OR PU59867-200X	TRIMMER CAPACITOR
	C7	NCT06CH-5R0A	CAPACITOR
	C8	NCB31EK-103A	CAPACITOR
	C9	NCB31EK-103A	CAPACITOR
	C10	ECEV0JV101P	E CAPACITOR
	C11	NCT07CH-100A	CAPACITOR
	C13	NCT07CH-220A	CAPACITOR
	C14	NCB31EK-103A	CAPACITOR

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C16	NCB31EK-103A	CAPACITOR
	C17	ECEV0JV220R	E CAPACITOR
	C18	NCB31EK-103A	CAPACITOR
	C19	ECEV1CV100R	E CAPACITOR
	C20	NCB31EK-103A	CAPACITOR
	C21	ECEV1CV100R	E CAPACITOR
	C22	NCT07CH-150A	CAPACITOR
	C23	NCT07CH-330A	CAPACITOR
	C24	NCT07CH-330A	CAPACITOR
	C25	NCT07CH-330A	CAPACITOR
	C26	NCB31EK-103A	CAPACITOR
	C27	ECEV1CV470P	E CAPACITOR
	C28	NCB31EK-103A	CAPACITOR
	C29	NCB31EK-103A	CAPACITOR
	C30	NCB31EK-103A	CAPACITOR
	C31	ECEV1CV470P	E CAPACITOR
	C32	NCB31EK-103A	CAPACITOR
	C33	ECEV1CV100R	E CAPACITOR
	C34	NCB31EK-103A	CAPACITOR
	C35	NCB31EK-103A	CAPACITOR
	C36	NCB31EK-103A	CAPACITOR
	C37	ECEV1EV4R7R	E CAPACITOR
	C38	NCB31EK-103A	CAPACITOR
	C39	NCB31EK-103A	CAPACITOR
	C40	ECEV1EV4R7R	E CAPACITOR
	C41	NCB31EK-103A	CAPACITOR
	C43	YU40265-3	E CAPACITOR
	C44	YU40265-3	E CAPACITOR
	C45	QEF81CM-105	TANTAL CAPACITOR
	C48	QEE81AM-226	TANTAL CAPACITOR
	C49	YU40265-3	E CAPACITOR
	C50	QEE80JM-226	TANTAL CAPACITOR
	C52	ECEV0JV220R	E CAPACITOR
	C53	QEF81CM-105	TANTAL CAPACITOR
	C54	PU59758-105	CAPACITOR
		OR QCF81CZ-105	CAPACITOR
	C55	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C56	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C57	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C58	PU59758-105	CAPACITOR
		OR QCF81CZ-105	CAPACITOR
	C59	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C60	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C61	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C62	PU59758-105	CAPACITOR
		OR QCF81CZ-105	CAPACITOR
	C63	QCY81EK-473	CAPACITOR
	C64	QCY81EK-473	CAPACITOR
	C65	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C66	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C67	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C68	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C69	ECEV1CV100R	E CAPACITOR
	C71	QEF81AM-226	TANTAL CAPACITOR
	C72	NCB31EK-103A	CAPACITOR

*⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C73	ECEV1CV100R	E CAPACITOR
	C74	NCB31EK-103A	CAPACITOR
	C75	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C76	NCB31EK-103A	CAPACITOR
	C77	ECEV0JV220R	E CAPACITOR
	C80	YU40265-1	E CAPACITOR
	C81	NCB31EK-103A	CAPACITOR
	C91	QEF81AM-475	TANTAL CAPACITOR
	C92	QEF81VM-334	TANTAL CAPACITOR
	C94	QEF81VM-334	TANTAL CAPACITOR
	C95	QEF81AM-475	TANTAL CAPACITOR
	C96	NCB31EK-103A	CAPACITOR
	C97	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C98	NCB31EK-103A	CAPACITOR
	C99	QEF81AM-475	TANTAL CAPACITOR
	C100	NCB31EK-103A	CAPACITOR
	C101	ECEV0JV220R	E CAPACITOR
	C102	NCB31EK-103A	CAPACITOR
	C103	ECEV1CV100R	E CAPACITOR
	C104	NCB31EK-103A	CAPACITOR
	C105	NCT07CH-100A	CAPACITOR
	C121	ECEV1EV4R7R	E CAPACITOR
	L101	YU40248-220KY	COIL
	L102	YU40248-220KY	COIL
	L103	PU58201-120K	COIL
	L105	YU40248-220KY	COIL
	L106	YU40248-220KY	COIL
	L107	PU58201-120K	COIL
	L108	YU40248-220KY	COIL
	L111	YU40248-220KY	COIL
	L112	YU40248-220KY	COIL
	L115	YU40248-220KY	COIL
	L116	YU40248-220KY	COIL
	L117	YU40248-220KY	COIL
	L121	PU59115	FERRATE BEADS
	L122	PU59115	FERRATE BEADS
	L123	PU59115	FERRATE BEADS
	L124	PU59115	FERRATE BEADS
	L125	PU59115	FERRATE BEADS
	L126	PU59115	FERRATE BEADS
	EQ101	YU40391-3	EQUALIZER
	LPF103	YU40390-3	LOW PASS FILTER
	LPF104	YU40444	LOW PASS FILTER
	LPF105	YU40443	LOW PASS FILTER
	LPF106	YU40444	LOW PASS FILTER
	TRAP101	YU40452	TRAP
	X101	YU40389	CRYSTAL RESONATOR
	SLD1	YU40341	INSULATER
	TP101	PU59111-2	TEST PIN
	TP102	PU59111-2	TEST PIN
	TP103	PU59111-2	TEST PIN
	TP104	PU59111-2	TEST PIN
	TP105	PU59111-2	TEST PIN
	TP106	PU59111-2	TEST PIN
	TP107	PU59111-2	TEST PIN
	TP108	PU59111-2	TEST PIN
	TP109	PU59111-2	TEST PIN
	TP110	PU59111-2	TEST PIN
	TP113	PU59111-2	TEST PIN
	TP114	PU59111-2	TEST PIN

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	TP115	PU59111-2	TEST PIN
	TP116	PU59111-2	TEST PIN
	CN101	YU40101-12	BOARD TO BOARD
	CN102	YU40101-12	BOARD TO BOARD
	CN103	YU40101-20	BOARD TO BOARD
	CN105	YU40251-9	BOARD TO BOARD
	CN106	YU40251-13	BOARD TO BOARD

– RB BOARD ASSEMBLY –

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20053A-C	RB BOARD ASSY
	D3	MA141WA	DIODE
	R18	NVP1301-103N	V RESISTOR
	R20	QRSA08J-332YN	RESISTOR

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15. VIDEO-2 BOARD ASSEMBLY <22>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20017L-C	VIDEO-2 BOARD ASSY
	IC201	UPC2371GH	IC
	IC202	MSM6985MS	IC
	IC203	MSM6985MS	IC
	Q201	2SC3936(BC)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	Q203	2SC3936(BC)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	Q204	2SA1576(QR)	TRANSISTOR
	OR	2SA1532(BC)	TRANSISTOR
	Q205	2SC3936(BC)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	Q206	2SA1576(QR)	TRANSISTOR
	OR	2SA1532(BC)	TRANSISTOR
	Q208	2SA1576(QR)	TRANSISTOR
	OR	2SA1532(BC)	TRANSISTOR
	Q209	2SC3936(BC)	TRANSISTOR
	OR	2SC4098(PQ)	TRANSISTOR
	R201	NRSA63J-333N	RESISTOR
	R202	NRSA63J-222N	RESISTOR
	R203	NRSA63J-822N	RESISTOR
	R204	NRSA63J-333N	RESISTOR
	R205	NRSA63J-393N	RESISTOR
	R207	NRSA63J-333N	RESISTOR
	R208	NRSA63J-223N	RESISTOR
	R209	NRSA63J-183N	RESISTOR
	R210	NRSA63J-333N	RESISTOR
	R212	NRSA63J-333N	RESISTOR
	R214	NRSA63J-103N	RESISTOR
	R215	NRSA63J-333N	RESISTOR
	R216	NRSA63J-123N	RESISTOR
	R217	NRSA63J-102N	RESISTOR
	R218	NRSA63J-102N	RESISTOR
	R219	NRSA63J-102N	RESISTOR
	R220	NRSA63J-102N	RESISTOR
	R221	NRSA63J-273N	RESISTOR
	R222	NRSA63J-273N	RESISTOR
	R223	NRSA63J-273N	RESISTOR
	R224	NRSA63J-273N	RESISTOR
	R225	NRSA63J-102N	RESISTOR
	R226	NRSA63J-102N	RESISTOR
	R227	NRSA63J-102N	RESISTOR
	R228	NRSA63J-123N	RESISTOR
	R229	QVZ3606-683H	V RESISTOR,CHROMA OFF SET
	R230	NRSA63J-223N	RESISTOR
	R232	NRSA63J-102N	RESISTOR
	R233	NRSA63J-753N	RESISTOR
	R241	NRSA63J-152N	RESISTOR
	R242	NRSA63J-102N	RESISTOR
	R243	NRSA63J-102N	RESISTOR
	R244	NVP1301-103N	V RESISTOR, COLOUR DIFF BAL
	R245	NRSA63J-152N	RESISTOR
	R246	NRSA63J-102N	RESISTOR
	R247	NRSA63J-102N	RESISTOR
	R248	NVP1301-103N	V RESISTOR,NOISE SUP
	R249	NRSA63J-222N	RESISTOR
	R250	NRSA63J-222N	RESISTOR
	C201	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C202	NCB31EK-103A	CAPACITOR
	C203	NCT07CH-150A	CAPACITOR
	C204	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C205	NCB31EK-103A	CAPACITOR
	C206	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C207	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C208	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C209	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C210	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C211	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C212	NCB31EK-103A	CAPACITOR
	C213	ECEV0JV220R	E CAPACITOR
	C214	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C215	QEF80GM-226	TANTAL CAPACITOR
	C221	NCB31EK-103A	CAPACITOR
	C222	NCB31EK-103A	CAPACITOR
	C223	QEF81AM-475	TANTAL CAPACITOR
	C224	QCFA1EZ-104	CAPACITOR
	C225	NCB31EK-103A	CAPACITOR
	C226	NCB31EK-103A	CAPACITOR
	C227	NCB31EK-103A	CAPACITOR
	C228	NCB31EK-103A	CAPACITOR
	C229	QEF81AM-475	TANTAL CAPACITOR
	C230	NCB31EK-103A	CAPACITOR
	C231	QCFA1EZ-104	CAPACITOR
	C232	NCB31EK-103A	CAPACITOR
	C233	ECEV0JV220R	E CAPACITOR
	C234	ECEV1CV100R	E CAPACITOR
	L201	PU58201-120K	COIL
	L203	PU58201-120K	COIL
	L204	PU58201-120K	COIL
	EQ201	YU40127-2	EQUALIZER
	EQ202	YU40082-3	EQUALIZER
	LPF201	YU40392	LOW PASS FILTER
	LPF202	YU40392	LOW PASS FILTER
	DL201	YU40128-3	DELAY LINE
	TP201	PU59111-2	TEST PIN
	TP202	PU59111-2	TEST PIN
	CN205	YU40252-9	BOARD TO BOARD
	CN206	YU40252-13	BOARD TO BOARD

16. ENCODER BORAD ASSEMBLY <23>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20033B-C	ENCODER BOARD ASSY
	IC301	AN2275S	IC
	IC302	TC4S69F	IC
	IC303	MC8181D	IC
	IC304	TC4S71F	IC
	IC305	H8D7051A	IC
	Q301	2SC3936(BC)	TRANSISTOR
		OR 2SC4177(56)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q302	2SC3936(BC)	TRANSISTOR
		OR 2SC4177(56)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	Q303	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
		OR 2SC4177(56)	TRANSISTOR
	Q304	2SC3931(BC)	TRANSISTOR
		OR 2SC4178(34)	TRANSISTOR
		OR 2SC4099(NP)	TRANSISTOR
	Q305	2SA1532(BC)	TRANSISTOR
		OR 2SA1611(56)	TRANSISTOR
		OR 2SA1576(QR)	TRANSISTOR
	Q306	2SK620	FE TRANSISTOR
	Q307	2SK620	FE TRANSISTOR
	Q309	2SC3936(BC)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
		OR 2SC4177(56)	TRANSISTOR
	Q310	2SC3936(BC)	TRANSISTOR
		OR 2SC4177(56)	TRANSISTOR
		OR 2SC4098(PQ)	TRANSISTOR
	D301	RD7.5M-T1B2	ZENER DIODE
	D302	MA141WK	DIODE
	R301	NRSA63J-332N	RESISTOR
	R302	NRSA63J-272N	RESISTOR
	R303	NRSA63J-272N	RESISTOR
	R304	NRSA63J-471N	RESISTOR
	R305	NRSA63J-681N	RESISTOR
	R306	NRSA63J-681N	RESISTOR
	R307	NVP1301-222N	V RESISTOR,BURST PHASE
	R308	NRSA63J-102N	RESISTOR
	R309	NVP1301-103N	V RESISTOR,WHITE CLIP
	R310	NRSA63J-102N	RESISTOR
	R311	NRSA63J-391N	RESISTOR
	R312	NRSA63J-681N	RESISTOR
	R313	NVP1301-103N	V RESISTOR, SYNC LEVEL
	R314	NRSA63J-822N	RESISTOR
	R315	NRSA63J-271N	RESISTOR
	R316	NRSA63J-561N	RESISTOR
	R317	NRSA63J-100N	RESISTOR
	R318	NRSA63J-561N	RESISTOR
	R319	NRSA63J-561N	RESISTOR
	R323	NRSA63J-102N	RESISTOR
	R324	NRSA63J-103N	RESISTOR
	R325	NRSA63J-103N	RESISTOR
	R326	NVP1301-103N	V RESISTOR, R-Y CARRIER BAL
	R327	NVP1301-103N	V RESISTOR, B-Y CARRIER BAL
	R328	NRSA63J-153N	RESISTOR
	R329	NRSA63J-102N	RESISTOR
	R330	NVP1301-103N	V RESISTOR, CHROMA PHASE
	R332	NRSA63J-102N	RESISTOR
	R333	NVP1301-103N	V RESISTOR,CHROMA GAIN
	R334	NRSA63J-102N	RESISTOR
	R335	NRSA63J-223N	RESISTOR
	R336	NVP1301-103N	V RESISTOR,BURST LEVEL
	R337	NRSA63J-223N	RESISTOR
	R338	NRSA63J-102N	RESISTOR
	R339	NRSA63J-102N	RESISTOR
	R340	NRSA63J-102N	RESISTOR
	R341	NRSA63J-100N	RESISTOR
	R343	NRSA63J-222N	RESISTOR
	R345	NRSA63J-103N	RESISTOR
	R346	NRSA63J-103N	RESISTOR
	R347	NRSA63J-222N	RESISTOR
	R348	NRSA63J-223N	RESISTOR
	R349	NRSA63J-103N	RESISTOR
	R350	NRSA63J-103N	RESISTOR
	R351	NRSA63J-472N	RESISTOR
	R352	NRSA63J-472N	RESISTOR
	R353	NVP1301-223N	V RESISTOR, B-Y LINE SW CARR BAL
	R354	NVP1301-223N	V RESISTOR, R-Y LINE SW CARR BAL
	R355	NVP1301-103N	V RESISTOR, R-Y PHASE SHIFT
	R356	NRSA63J-331N	RESISTOR
	R357	NRSA63J-821N	RESISTOR
	R358	NRSA63J-821N	RESISTOR
	R359	NRSA63J-471N	RESISTOR
	R360	NRSA63J-153N	RESISTOR
	B301	NRSA63J-0R0A	RESISTOR
	B302	NRSA63J-0R0A	RESISTOR
	B303	NRSA63J-0R0A	RESISTOR
	B304	NRSA63J-0R0A	RESISTOR
	B305	QRSA08J-0R0Y	RESISTOR
	B307	QRSA08J-0R0Y	RESISTOR
	B308	NRSA63J-0R0A	RESISTOR
	C301	NCT07CH-560A	CAPACITOR
	C302	NCT07CH-560A	CAPACITOR
	C303	NCT07CH-120A	CAPACITOR
	C304	NCT07CH-390A	RESISTOR
	C305	NCB31EK-103A	CAPACITOR
	C306	NCB31EK-103A	CAPACITOR
	C307	QED40JM-127	E CAPACITOR
	C308	NCB31EK-103A	CAPACITOR
	C309	NCR21CM-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
		OR NCR21CK-473A	CAPACITOR
	C310	NCB31EK-103A	CAPACITOR
	C311	NCB31EK-103A	CAPACITOR
	C312	NCR21CM-473A	CAPACITOR
		OR NCR21CK-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C313	PU59758-105	CAPACITOR
		OR QCF81CZ-105	CAPACITOR
	C314	QEE40JM-476	TANTAL CAPACITOR
	C315	QEE41CM-476	TANTAL CAPACITOR
	C316	NCB31EK-103A	CAPACITOR
	C317	NCB31EK-103A	CAPACITOR
	C318	PU59758-105	CAPACITOR
	C319	PU59758-105	CAPACITOR
	C320	NCR21CM-473A	CAPACITOR
		OR NCR21CK-473A	CAPACITOR
		OR PU59913-473	CAPACITOR
	C321	QED41AM-107R	E CAPACITOR
	C322	QED41CM-107R	E CAPACITOR
	C324	QEE81DM-155	T.CAP
	C325	QEE81DM-226	TANTAL CAPACITOR
	C326	NCB31EK-103A	CAPACITOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	C327	NCT07CH-820A	CAPACITOR
	C328	NCT07CH-101A	CAPACITOR
	C329	NCT07CH-101A	CAPACITOR
	C330	NCB31EK-103A	CAPACITOR
	C331	NCF31CZ-104A	CAPACITOR
	C332	NCF31CZ-104A	CAPACITOR
	L301	YU40248-101KY	COIL
	L302	YU40248-220KY	COIL
	L303	YU40248-220KY	COIL
	BPF301	YU40393-2	BAND PASS FILTER
	TRAP301	YU40487	443 TRAP
	SLD1	YU40341	INSULATER
	TP301	PU59111-2	TEST PIN
	TP302	PU59111-2	TEST PIN
	TP303	PU59111-2	TEST PIN
	TP304	PU59111-2	TEST PIN
	TP305	PU59111-2	TEST PIN
	TP306	PU59111-2	TEST PIN
	CN301	YU40105-12	CONNECTOR
	CN302	YU40105-12	B/B HOUSING-DS
	CN303	PU58655-10	CAP HOUSING
	CN304	YU40096-2Y	W/B CN.WFR R/A
	CN305	YU40096-4Y	W/B CN.WFR R/A
	CN306	PU58655-3	CAP HOUSING
	CN307	YU40096-2	W/B CN.WFR R/A
⚠	CP301	ICP-F20	CIRCUIT PROTECTOR
⚠	CP302	ICP-F10	CIRCUIT PROTECTOR

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* 17. INDICATOR BOARD ASSEMBLY <24> *

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#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20019D-03-C	INDICATOR BOARD ASSY
	IC401	VC2044	IC
	IC402	VC2041	IC
	IC403	M54641FP	IC
	IC404	UPC324G2	IC
	IC405	6VT08	IC
	Q401	2SA1532(BC)	TRANSISTOR
	Q403	2SC3936(BC)	TRANSISTOR
	Q404	2SC3936(BC)	TRANSISTOR
	Q405	2SC3936(BC)	TRANSISTOR
	Q406	2SC3936(BC)	TRANSISTOR
	Q407	2SA1532(BC)	TRANSISTOR
	Q408	2SA1532(BC)	TRANSISTOR
	Q409	2SK198P,Q	TRANSISTOR
	Q410	2SC3936(BC)	TRANSISTOR
	Q411	2SA1532(BC)	TRANSISTOR
	Q412	2SA1532(BC)	TRANSISTOR
	Q413	2SA1532(BC)	TRANSISTOR
	D401	RD8.2MB2	ZENER DIODE
	D402	MA704	DIODE
	D403	MA141WK	DIODE
	D404	MA704	DIODE
	D405	MA184	DIODE
	OR	MA185	DIODE
	R401	NRSA63J-122N	RESISTOR
	R402	NRSA63J-222N	RESISTOR
	R404	NRSA63J-104N	RESISTOR
	R406	NRSA63J-104N	RESISTOR
	R407	NRSA63J-0R0A	RESISTOR
	R408	NRSA63J-104N	RESISTOR
	R409	NRSA63J-223N	RESISTOR
	R410	NRSA63J-101N	RESISTOR
	R411	NRSA63J-101N	RESISTOR
	R413	QRD161J-222	RESISTOR
	R415	NRSA63J-472N	RESISTOR
	R416	NRSA63J-472N	RESISTOR
	R417	NRSA63J-153N	RESISTOR
	R418	**QRD161J-103**	**RESISTOR**
	R420	NRSA63J-222N	RESISTOR
	R421	NRSA63J-222N	RESISTOR
	R422	NRSA63J-104N	RESISTOR
	R423	NRSA63J-682N	RESISTOR
	R424	NRSA63J-333N	RESISTOR
	R425	NRSA63J-103N	RESISTOR
	R426	NRSA63J-152N	RESISTOR
	R427	NRSA63J-222N	RESISTOR
	R428	NRSA63J-152N	RESISTOR
	R429	NRSA63J-472N	RESISTOR
	R430	NRSA63J-101N	RESISTOR
	R431	NRSA63J-472N	RESISTOR
	R432	NRSA63J-333N	RESISTOR
	R433	NRSA63J-223N	RESISTOR
	R434	NRSA63J-101N	RESISTOR
	R435	NRSA63J-333N	RESISTOR
	R436	NRSA63J-223N	RESISTOR
	R437	NRSA63J-473N	RESISTOR
	R438	NRSA63J-473N	RESISTOR
	R439	NRSA63J-122N	RESISTOR
	R440	NRSA63J-683N	RESISTOR
	R441	NRSA63J-682N	RESISTOR
	R442	NRSA63J-153N	RESISTOR
	R443	NRSA63J-222N	RESISTOR
	R445	NRSA63J-272N	RESISTOR
	R446	NVP1301-102N	V RESISTOR,IRIS ADJ
	R447	NRSA63J-222N	RESISTOR
	R448	NRSA63J-560N	RESISTOR
	R449	NRSA63J-273N	RESISTOR
	R450	NRSA63J-223N	RESISTOR
	R451	NRSA63J-473N	RESISTOR
	R452	NRSA63J-123N	RESISTOR
	R453	NRSA63J-123N	RESISTOR
	R454	NRSA63J-103N	RESISTOR
	R455	NRSA63J-103N	RESISTOR
	R457	NRSA63J-0R0A	RESISTOR
	R458	NRSA63J-102N	RESISTOR
	R459	NRSA63J-103N	RESISTOR
	R460	NRSA63J-103N	RESISTOR
	R462	NRSA63J-0R0A	RESISTOR
	R463	NRSA63J-333N	RESISTOR
	R464	NRSA63J-682N	RESISTOR
	R465	NRSA63J-104N	RESISTOR
	R466	NRSA63J-104N	RESISTOR
	R467	NRSA63J-104N	RESISTOR
	R468	NRSA63J-104N	RESISTOR
	R469	NRSA63J-104N	RESISTOR
	R470	NRSA63J-102N	RESISTOR
	R471	NRSA63J-104N	RESISTOR
	R472	NRSA63J-0R0A	RESISTOR
	R474	NRSA63J-222N	RESISTOR
	R475	NRSA63J-222N	RESISTOR
	R476	NRSA63J-0R0A	RESISTOR
	R477	NRSA63J-0R0A	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R478	NRSA63J-0R0A	RESISTOR
	R479	ERT-D2FGL601S	RESISTOR
	OR	NTH5D471KA	RESISTOR
	OR	NTH5D471LA	RESISTOR
	B401	NRSA63J-0R0A	RESISTOR
	B402	NRSA63J-0R0A	RESISTOR
	B403	NRSA63J-0R0A	RESISTOR
	B404	NRSA63J-0R0A	RESISTOR
	B405	NRSA63J-0R0A	RESISTOR
	B406	NRSA63J-0R0A	RESISTOR
	C402	NCF31CZ-104A	CAPACITOR
	C403	QEE81AM-226	E CAPACITOR
	C404	QCFA1EZ-104	CAPACITOR
	C405	NCT07CH-180A	CAPACITOR
	C406	NCT07CH-220A	CAPACITOR
	C407	NCT07CH-220A	CAPACITOR
	C408	QEF80JM-106	TANTAL CAPACITOR
	C408-2	QEE81AM-476	E CAPACITOR
	C409	ECEV0JV220R	E CAPACITOR
	C410	QCFA1EZ-104	CAPACITOR
	C411	ECEV1CV100R	E CAPACITOR
	C412	ECEV0JV220R	E CAPACITOR
	C413	PU59758-105	CAPACITOR
	OR	QCF81CZ-105	CAPACITOR
	C414	ECEV1CV100R	E CAPACITOR
	C415	ECEV0JV220R	E CAPACITOR
	C416	NCT07CH-101A	CAPACITOR
	C417	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C418	QEF80GM-226	TANTAL CAPACITOR
	C419	QEF80JM-106	TANTAL CAPACITOR
	C420	QEF80JM-475	TANTAL CAPACITOR
	C421	QEF81EM-474	TANTAL CAPACITOR
	C422	ECEV1CV100R	E CAPACITOR
	C423	NCB31EK-103A	CAPACITOR
	C424	NCR21CM-473A	CAPACITOR
	OR	PU59913-473	CAPACITOR
	C425	NCS31HK-221A	CAPACITOR
	C426	NCF31CZ-104A	CAPACITOR
	C427	NCF31CZ-104A	CAPACITOR
	C428	NCF31CZ-104A	CAPACITOR
	C429	NCF31CZ-104A	CAPACITOR
	C430	NCF31CZ-104A	CAPACITOR
	C431	NCF31CZ-104A	CAPACITOR
	C432	NCF31CZ-104A	CAPACITOR
	C433	NCF31CZ-104A	CAPACITOR
	L401	PU58201-120K	COIL
	L402	PU58201-120K	COIL
	L403	PU58201-120K	COIL
	L404	PU58201-120K	COIL
	L405	PU58201-120K	COIL
	L406	PU58201-120K	COIL
	X401	YU40141	CRYSTAL RESONATOR
	SLD401	YU40341	INSULATER
	CN401	YU40179-110	CAP HOUSING
	CN402	YU40108-10	FPC CONNECTOR
	CN403	YU40105-20	CAP HOUSING,(BOARD TO BOARD)
	CN404	YU40105-10	CAP HOUSING,(BOARD TO BOARD)
	CN405	YU40096-7	CAP HOUSING
	CN406	YU40096-4	CAP HOUSING
	CN407	YU40096-2	CAP HOUSING
	CN408	YU40096-10	CAP HOUSING
	CN409	YU40096-2R	CAP HOUSING
	CN410	YU40096-2B	CAP HOUSING

#⚠ REF NO. PART NO. PART NAME, DESCRIPTION

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18. FULL AUTO BOARD ASSEMBLY <25>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20020B-C	FAW BOARD ASSY
	IC501	VC2038	IC
	IC502	BA10324F	IC
	OR	IR3702N1	IC
	OR	UPC324G2	IC
	IC503	BA10324F	IC
	OR	UPC324G2	IC
	Q503	2SC2412K(S)	TRANSISTOR
	Q504	2SC2412K(S)	TRANSISTOR
	D501	MA716	DIODE
	D502	MA716	DIODE
	PD501	PD170V1	PHOTO DIODE
	R501	NRSA63J-154N	RESISTOR
	R502	NRSA63J-123N	RESISTOR
	R503	NVP1301-223N	V RESISTOR,AW INDOOR B
	R504	NRSA63J-563N	RESISTOR
	R505	NRSA63J-183N	RESISTOR
	R506	NVP1301-223N	V RESISTOR,AW INDOOR R
	R507	NRSA63J-563N	RESISTOR
	R508	NRSA63J-223N	RESISTOR
	R509	NRSA63J-683N	RESISTOR
	R511	NRSA63J-473N	RESISTOR
	R512	NRSA63J-473N	RESISTOR
	R513	NRSA63J-823N	RESISTOR
	R514	NRSA63J-0R0A	RESISTOR
	R515	NVP1301-473N	V RESISTOR,INDOOR LIM
	R516	NRSA63J-273N	RESISTOR
	R517	NRSA63J-123N	RESISTOR
	R518	NVP1301-473N	V RESISTOR,OUTDOOR LIM
	R519	NRSA63J-333N	RESISTOR
	R520	NRSA63J-0R0A	RESISTOR
	R521	NVP1301-473N	V RESISTOR,PRE B INDOOR
	R522	NRSA63J-473N	RESISTOR
	R523	NRSA63J-0R0A	RESISTOR
	R524	NVP1301-473N	V RESISTOR,PRE B FL
	R525	NRSA63J-473N	RESISTOR
	R526	NRSA63J-0R0A	RESISTOR
	R527	NVP1301-473N	V RESISTOR,PRE B OUTDOOR
	R528	NRSA63J-473N	RESISTOR
	R529	NRSA63J-103N	RESISTOR
	R530	NVP1301-473N	V RESISTOR,AW B OUTDOOR LIM
	R531	NRSA63J-473N	RESISTOR
	R533	QRD161J-153	RESISTOR
	R534	NVP1301-473N	V RESISTOR,AW B INDOOR LIM
	R535	NRSA63J-473N	RESISTOR
	R536	NRSA63J-123N	RESISTOR
	R537	NVP1301-473N	V RESISTOR,PRE R INDOOR
	R538	NRSA63J-273N	RESISTOR
	R539	NRSA63J-103N	RESISTOR
	R540	NVP1301-473N	V RESISTOR,PRE R FL
	R541	NRSA63J-333N	RESISTOR
	R542	NRSA63J-103N	RESISTOR
	R543	NVP1301-473N	V RESISTOR,PRE R OUTDOOR
	R544	NRSA63J-393N	RESISTOR
	R548	NRSA63J-104N	RESISTOR
	R549	NVP1301-224N	V RESISTOR,AW B GAIN
	R550	NRSA63J-103N	RESISTOR

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	R551	NRSA63J-153N	RESISTOR
	R552	QRD161J-153	RESISTOR
	R553	NVP1301-224N	V RESISTOR,AW R GAIN
	R554	NRSA63J-103N	RESISTOR
	R555	NRSA63J-104N	RESISTOR
	R557	NRSA63J-152N	RESISTOR
	R558	NRSA63J-102N	RESISTOR
	R559	NRSA63J-102N	RESISTOR
	R560	NRSA63J-122N	RESISTOR
	R561	NRSA63J-103N	RESISTOR
	R562	NRSA63J-103N	RESISTOR
	R563	QRD161J-222	RESISTOR
	R567	NRSA63J-102N	RESISTOR
	R568	NRSA63J-273N	RESISTOR
	R569	NRSA63J-0R0A	RESISTOR
	R571	NRSA63J-822N	RESISTOR
	R572	NRSA63J-223N	RESISTOR
	R579	NRSA63J-472N	RESISTOR
	R580	NRSA63J-0R0A	RESISTOR
	R583	NRSA63J-103N	RESISTOR
	R584	NRSA63J-332N	RESISTOR
	R585	NRSA63J-103N	RESISTOR
	R586	NRSA63J-222N	RESISTOR
	R587	NRSA63J-0R0A	RESISTOR
	R588	NRSA63J-0R0A	RESISTOR
	R589	NRSA63J-472N	RESISTOR
	R590	NRSA63J-472N	RESISTOR
	B601	NRSA63J-0R0A	RESISTOR
	B602	NRSA63J-0R0A	RESISTOR
	B603	NRSA63J-0R0A	RESISTOR
	B604	NRSA63J-0R0A	RESISTOR
	B605	NRSA63J-0R0A	RESISTOR
	B606	NRSA63J-0R0A	RESISTOR
	B607	NRSA63J-0R0A	RESISTOR
	B608	NRSA63J-0R0A	RESISTOR
	B609	NRSA63J-0R0A	RESISTOR
	C501	NEH11CM100NR	E CAPACITOR
	C502	PU59758-105	CAPACITOR
	C503	NCB31EK-103A	CAPACITOR
	C504	NEH10GM470NR	E CAPACITOR
	C505	NCB31HK-152A	CAPACITOR
	C506	NCB31HK-152A	CAPACITOR
	C507	NCB31HK-152A	CAPACITOR
	C508	NEH10GM470NR	E CAPACITOR
	C509	NEH10JM220NR	E CAPACITOR
	C510	NCB31EK-103A	CAPACITOR
	C511	NCB31EK-103A	CAPACITOR
	C513	NEH10GM470NR	E CAPACITOR
	C514	NEH10GM470NR	E CAPACITOR
	C515	NEH11EM4R7NR	E CAPACITOR
	C516	NEH11EM4R7NR	E CAPACITOR
	L501	PU58201-220K	COIL
	SW501	PU57008	SWITCH(TACT),BLC
	SW502	PU57008	SWITCH(TACT),FADER
	FIL1	YQ40394	WHITE FILTER
	SLD1	YQ40395	SHIELD CASE
	SLD2	YQ40396	SHIELD PLAT
	TP501	PU59111-2	TEST PIN
	TP502	PU59111-2	TEST PIN
	TP503	PU59111-2	TEST PIN
	TP504	PU59111-2	TEST PIN
	TP507	PU59111-2	TEST PIN
	CN501	YU40101-10	CAP HOUSING,(BOARD TO BOARD)

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION

19. MIC AMP BOARD ASSEMBLY <26>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB30009A-01-C	MIC AMP BOARD ASSY
	IC701	M5282FP	IC
	R701	NRSA63J-102N	RESISTOR
	R702	NRSA63J-562N	RESISTOR
	R703	NRSA63J-102N	RESISTOR
	R704	NRSA63J-473N	RESISTOR
	R705	NRSA63J-221N	RESISTOR
	R706	NRSA63J-223N	RESISTOR
	R708	NRSA63J-682N	RESISTOR
	R709	NRSA63J-103N	RESISTOR
	R710	NRSA63J-0R0A	RESISTOR
	R711	QRD161J-222	RESISTOR
	C701	ECEV1EV4R7R	E CAPACITOR
	C702	ECEV1CV470P	E CAPACITOR
	C703	ECEV1CV470P	E CAPACITOR
	C704	NCT07CH-101A	CAPACITOR
	C705	ECEV1EV4R7R	E CAPACITOR
	C706	NCB31HK-152A	CAPACITOR
	C707	ECEV1EV4R7R	E CAPACITOR
	C708	ECEV1CV470P	E CAPACITOR

20. LED BOARD <33>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWB	YB40001	LED BOARD
	D1	SIM-20ST	LE DIODE

21. H. DRIVER BOARD ASSEMBLY <43>

#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
	PWBA	YB20024A-C	H.DRIVER BOARD ASSY
	Q1	2SA1610	TRANSISTOR
	Q2	2SC4176	TRANSISTOR
	Q3	2SA1610	TRANSISTOR
	Q4	2SC4176	TRANSISTOR
	D1	MA141WK	DIODE
	D2	MA141WA	DIODE
	R1	NRSA63J-220N	RESISTOR
	R2	NRSA63J-220N	RESISTOR
	R3	NRSA63J-220N	RESISTOR
	R4	NRSA63J-220N	RESISTOR
	R5	NRSA63J-0R0A	RESISTOR
	C1	NCT07CH-470A	CAPACITOR
	C2	NCT07CH-470A	CAPACITOR
	C3	NCT07CH-470A	CAPACITOR
	C4	NCT07CH-470A	CAPACITOR
	C5	NCB31EK-103A	CAPACITOR
	C6	QEE81CM-226	E CAPACITOR
	C7	QCTA1CH-680	CAPACITOR
	C8	QCTA1CH-220	CAPACITOR
	L1	YU40248-101KY	COIL

22. EVF BOARD ASSEMBLY <50>

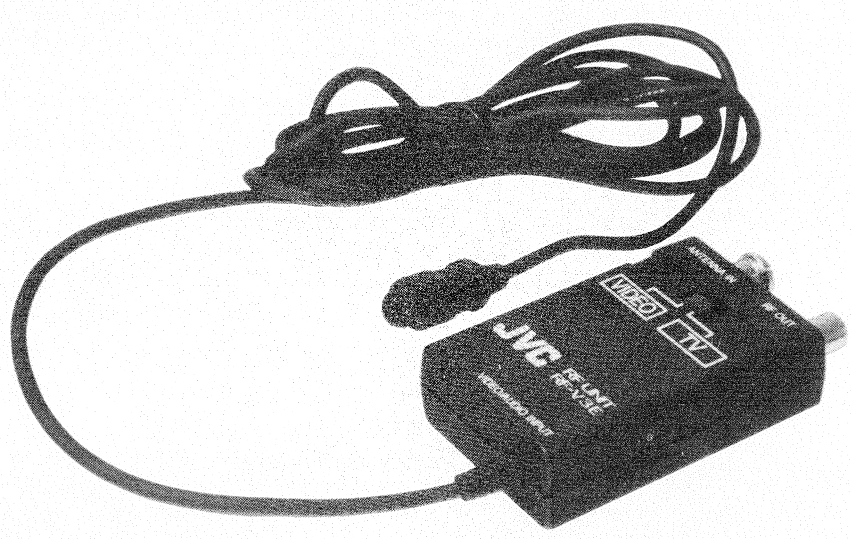
#⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION	PRICE
	PWBA	YU40355B-01-C	EVF BOARD ASSY	
⚠	TF	PU48295	TH FUSE	69
⚠	IC1	BA7125L	IC	456
	D21	DAN202K	DIODE	17
	D31	1SS133	DIODE	8
	D32	1SS136	DIODE	10
	D33	ERA15-06TU20	DIODE	14
	D34	ERA15-06TU20	DIODE	14
	RX1	QRD163J-0R0	RESISTOR	5
	RX2	QRD163J-0R0	RESISTOR	5
	VR1	QVZ3521-103	V RESISTOR	13
	VR2	QVZ3521-102	V RESISTOR	13
	VR3	QVZ3521-222	V RESISTOR	13
	VR4	YU40382	V RESISTOR	333
	R01	QRSA08J-821YN	RESISTOR	5
	R02	QRSA08J-824YN	RESISTOR	5
	R03	QRSA08J-120YN	RESISTOR	5
	R04	QRSA08J-104YN	RESISTOR	5
	R05	QRSA08J-103YN	RESISTOR	5
	R06	QRSA08J-823YN	RESISTOR	5
	R07	QRSA08J-682YN	RESISTOR	5
	R08	QRSA08J-472YN	RESISTOR	5
	R09	QRSA08J-471YN	RESISTOR	5
	R10	QRSA08J-471YN	RESISTOR	5
	R21	QRSA08J-472YN	RESISTOR	5
	R22	QRSA08J-561YN	RESISTOR	5
	R23	QRSA08J-203YN	RESISTOR	5
	R24	QRSA08J-103YN	RESISTOR	5
	R25	QRSA08J-103YN	RESISTOR	5
	R26	QRSA08J-102YN	RESISTOR	5
	R27	QRSA08J-334YN	RESISTOR	5
	R31	QRSA08J-332YN	RESISTOR	5
	R32	QRD183J-625	RESISTOR	5
	C01	QFN41HJ-222	M CAPACITOR	12
	C02	QER41CM-106	E CAPACITOR	17
	C03	QCYA1HK-103	CAPACITOR	9
	C04	QEK40JM-227	E CAPACITOR	17
	C05	QER41AM-226	E CAPACITOR	17
	C06	QCYA1HK-102	CAPACITOR	9
	C07	QEK41AM-107	E CAPACITOR	20
	C08	QER41HM-105	E CAPACITOR	17
	C09	QCYA1HK-223	CAPACITOR	
	C10	QEK41AM-107	E CAPACITOR	20
	C11	QER41HM-104	E CAPACITOR	17
	C12	QER41HM-104	E CAPACITOR	17
	C13	QCTA1CH-161	CAPACITOR	9
	C14	QCYA1HK-682	CAPACITOR	9
	C15	QFN41HJ-473	M CAPACITOR	15
	C21	QER41CM-106	E CAPACITOR	17
	C22	QER41CM-106	E CAPACITOR	17
	C23	QCTA1CH-161	CAPACITOR	9
	C24	QER41HM-225	E CAPACITOR	17
	C31	QER41VM-106	E CAPACITOR	14
	C32	QER41HM-105	E CAPACITOR	17
	C33	QEK41AM-107	E CAPACITOR	20
	C34	QFG42AJ-332	PP CAPACITOR	14
		QFG42AJ-392	PP CAPACITOR	14
		QFG42AJ-472	PP CAPACITOR	14
		QFG42AJ-821	PP CAPACITOR	14
		QFG42AJ-222	PP CAPACITOR	14
		QFG42AJ-122	PP CAPACITOR	
		QFG42AJ-182	PP CAPACITOR	14
		QFG42AJ-272	PP CAPACITOR	14
		QFG42AJ-102	PP CAPACITOR	14
		QFG42AJ-152	PP CAPACITOR	14
	C35	PU59343	FM CAPACITOR	19
	C36	QCFA1HZ-333	CAPACITOR	9
	L1	PU53223-101H	PEAKING COIL	17
	L2	PU49995-101	PEAKING COIL	15
⚠	TR1	2SC3665	TRANSISTOR	38
	TR2	2SC2812L6,L7	TRANSISTOR	14
	CN1	YU40354	VF CABLE	371
	CN2	YU40351	CRT SOCKET	152
⚠	CP	ICP-N10	CIRCUIT PROTECTOR	50
⚠	FBT	YU40375	FBT	
	HLC	YU40353	H.L.COIL	105

JVC

SERVICE MANUAL

RF UNIT

RF-V3E


ANTENNA IN
VIDEO
TV
RF OUT
JVC RF UNIT RF-V3E
VIDEO/AUDIO INPUT

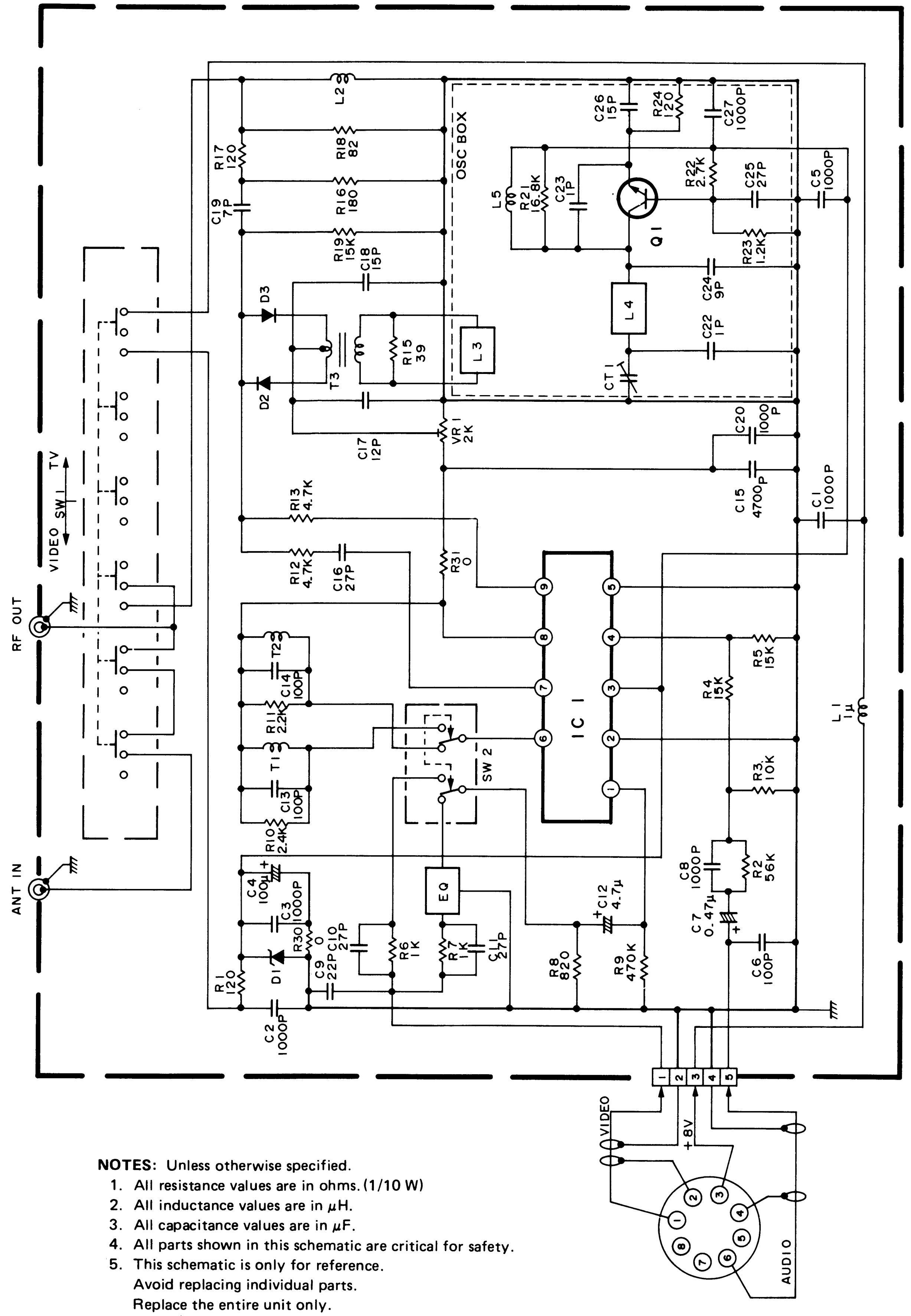
SPECIFICATIONS

Output channel	: UHF channel 32 – 40 (adjustable)
Initial channel setting	: UHF 36
Power source	: DC 8 V ⎓ 20 mA (from VideoMovie)
Dimensions	: 52(W) x 80(H) x 24(D) mm excl. cable
Cable length	: 2.5 m
Weight	: Approx. 160 g

No. 86025 (2/2)
November 1987

1. DIAGRAM AND CIRCUIT BOARD

1.1 SCHEMATIC DIAGRAM

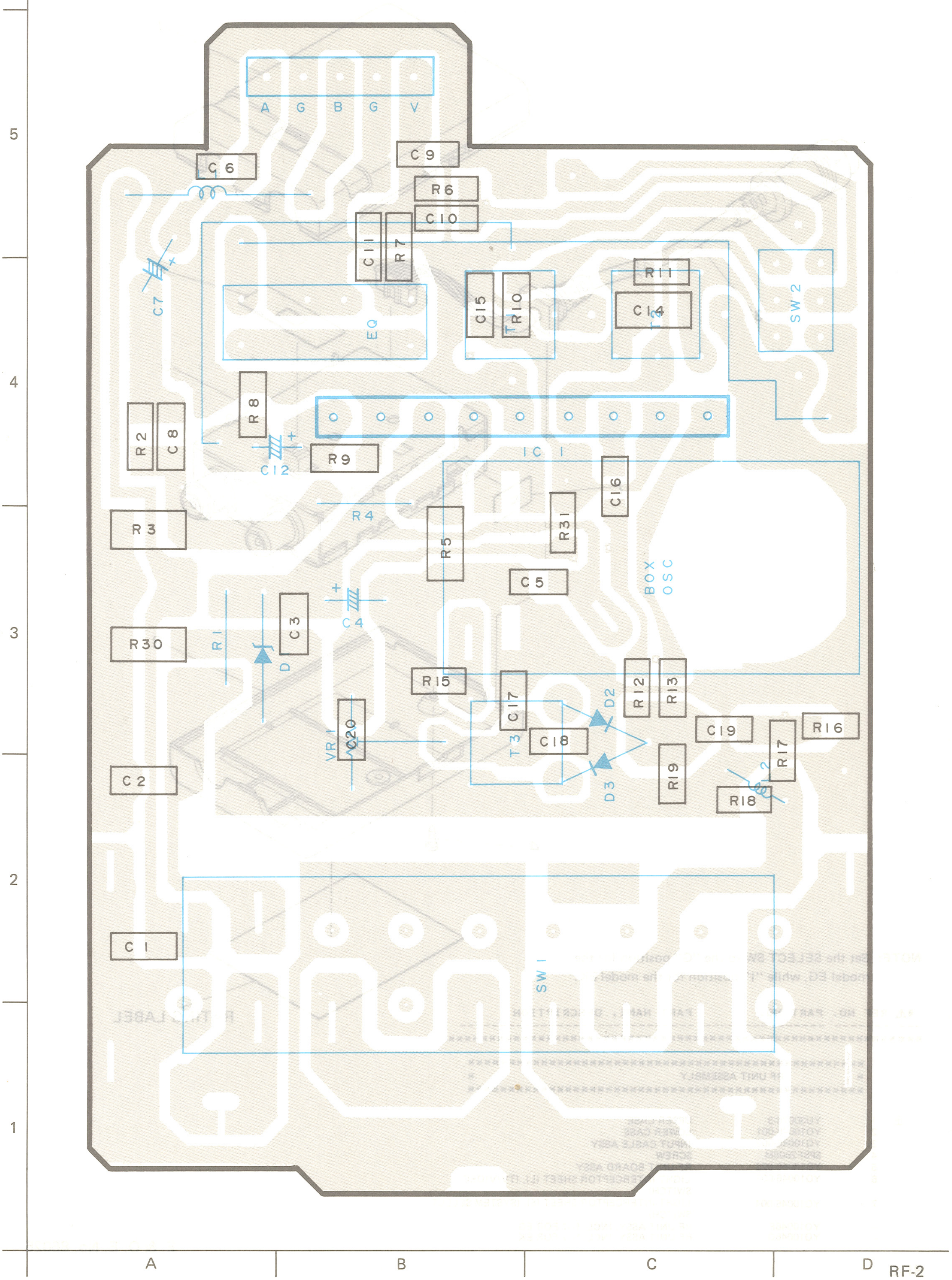


OSC BOX
L2
R17 120
R18 82
R16 180
R19 15K
C19 7P
C18 15P
D3
D2
T3
R15 39
L3
C17 12P
VR1 2K
R13 4.7K
R12 4.7K
C16 27P
R31 0
C26 15P
R24 120
C27 1000P
L5
R21 16.8K
C23 1P
Q1
R22 2.7K
C25 27P
C5 1000P
R23 1.2K
C24 9P
L4
C22 1P
CT1
C20 1000P
C15 4700P
C1 1000P
IC1
SW1
TV
VIDEO
RF OUT
ANT IN
T2
C14 100P
R11 2.2K
T1
C13 100P
R10 2.4K
SW2
R5 15K
R4 15K
R3 10K
L1 1μ
C8 1000P
R2 56K
C7 0.47μ
C6 100P
C4 100μ
C3 1000P
R30 0
C10 27P
C9 22P
D1
R1 120
C2 1000P
EQ
R6 1K
R7 1K
C11 27P
R8 820
C12 4.7μ
R9 470K
VIDEO
+8V
AUDIO

NOTES: Unless otherwise specified.

1. All resistance values are in ohms. (1/10 W)
2. All inductance values are in μH.
3. All capacitance values are in μF.
4. All parts shown in this schematic are critical for safety.
5. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entire unit only.
6. Parts in the box of dotted line are included in the OSC BOX unit.

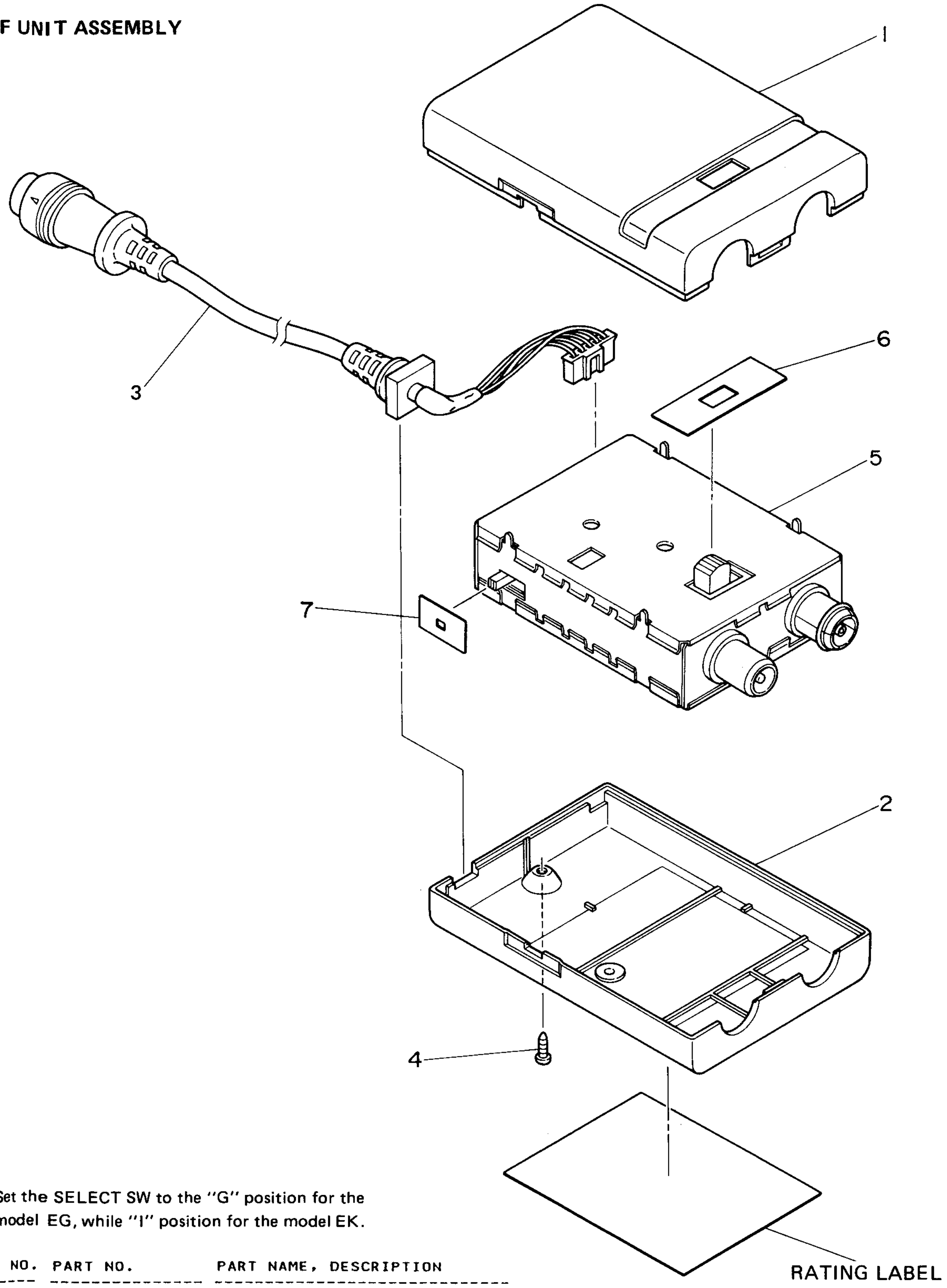
1.2 CIRCUIT BOARD



6
5
4
3
2
1
A
B
C
D
A G B G V
C 6
C 9
R 6
C 10
C 11
R 7
C 7
EQ
C 15
R 10
R 11
C 14
T 2
SW 2
R 8
R 2
C 8
C 12
R 9
IC 1
C 16
R 3
R 4
R 31
R 5
BOX OSC
C 5
C 4
R 30
R 1
D
C 3
R 15
C 17
D 2
R 12
R 13
C 19
R 16
VR 1
C 20
T 3
C 18
D 3
R 19
R 17
R 18
C 2
C 1
SW 1

2. EXPLODED VIEWS AND PARTS LIST

2.1 RF UNIT ASSEMBLY



NOTE: Set the SELECT SW to the "G" position for the model EG, while "I" position for the model EK.

♦⚠	REF NO.	PART NO.	PART NAME, DESCRIPTION
			RF UNIT ASSEMBLY
⚠	1	YU30078-3	UPPER CASE
	2	YQ10046-001	LOWER CASE
	3	YQ10046-002	INPUT CABLE ASSY
	4	SPSF2608M	SCREW
	5	YQ10046-022	RF UNIT BOARD ASSY
	6	YQ10046-003	LIGHT INTERCEPTOR SHEET (L), (TV/VIDEO SWITCH)
	7	YQ10046-004	LIGHT INTERCEPTOR SHEET (S), (SYSTEM SELECT SWITCH)
	–	YQ10046E	RF UNIT ASSY, INCL. 1–7 FOR EG
	–	YQ10046G	RF UNIT ASSY, INCL. 1–7 FOR EK

E. & O. E. No. 86025